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<http://dx.doi.org/doi:10.21954/ou.ro.0000f97b>

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**MEDICAL IDEAS IN ENGLISH POETRY**  
**TO THE END OF THE SEVENTEENTH CENTURY**

**A Dissertation submitted for the  
Degree of Master of Philosophy**

**Department of the History  
of Science and Technology**

**Open University**

DATE OF SUBMISSION , 27 SEPTEMBER 1999  
DATE OF AWARD , 5 DECEMBER 2000

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## **ABSTRACT OF THESIS**

Conventional historical research by the study of prose medical texts (often in Latin) will provide an index of the depth of the professional knowledge available to the contemporary physician, but examination of lyrical and dramatic poetry provides a measure of the diffusion of this knowledge into the laity.

Absolute certainty in Galenic humoral theory comes through in the verses of Chaucer and poets of the later mediaeval period: as poetry is traced through to the seventeenth century, however, scepticism grows and gives way to disbelief, culminating in the Comedy of Humours genre which actively ridicules it. A similar trend can be traced with respect to astrological medicine: the science of iatromathematica (astrological medicine) was a cornerstone of mediaeval medicine. Seventeenth century astronomical discoveries mentioned in poetry intended for the educated layman underline the current uncertain status of astrology.

The concept of moral retribution as a cause for disease was suggested in fifteenth and sixteenth century poetry. Even by the end of the seventeenth century, the abundant poetical references to syphilis and smallpox indicate that the literate layman was very slow to accept the germ theory advanced by Fracastorius in the mid 16th century.

Although by the late 1600s, the concept of the circulation of blood had found its way into English poetry, the study of these verses give evidence of the initial chill response to Harvey's ideas in the years immediately after 1628.

Certain medical topics are mentioned in the contemporary poetry and meanings can be drawn from this, both pragmatic and allegorical: poetry gives us a clear view of current ideas about the human body and in particular its important relationship to the rest of the universe.

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## **PROLEGOMENON**

*A poet has, in all truth, but one purpose, which may be termed self-expression; but in fulfilling that he is certain, however much of an individualist he may be, to fulfil another, namely the exposition of the tides moving in humanity in the age in which he writes. He is, if he have any depth of vision in him - and without vision, not only do the people perish, but no poetry exists, the interpreter of his age.<sup>1</sup>*

Lord GORELL (1948) *The Essentials of Poetry*.

## STARTING POINT

I have always had a great love of English poetry, particularly that which was written before the eighteenth century. As a medical student, I became interested in medical allusions in Poetry and published two articles on the subject<sup>2</sup>. When I was a registrar in 1974, I won the Maccabaeian Prize and Medal of the Worshipful Society of Apothecaries of London for an essay on Medicine in Poetry. I later developed an interest in health education aspects of poetry by which popular verse may be used as a vehicle to educate the laity on some particular aspect of health or hygiene, and in 1980, I wrote a short article about the occupational hazard of lead poisoning in the lead miners of Derbyshire.<sup>3</sup>

It was the irony in the poem on which that article was based - that mercury should be used as an antidote to lead poisoning - which made me aware of how a study of contemporary poetry gives an insight into the erroneous medical beliefs and practices of the time and how poetry can be used as a method of getting an important health education message to the general public. The use of mercury and the other mercuric medicines were amongst the more pernicious features of nineteenth century medicine.\*

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\* Not only metallic mercury, but also mercurial "grey powder" (*Hydrarg. c. Cret.*), *Calomel*, and even teething powders containing mercury for rubbing on infants' gums were used. These remedies go back to the mineral remedies of Paracelsus in the 16th century (vide infra II.9). For a discussion of mercury in 18th century medicine, see Young (1980).

## **APOLOGIA**

The Queen's English Society gives little practical help over the lamentable lack in English of a suitable word which does not specify the gender of the third person singular. This is despite much correspondence in its journal. Rather than adopt the clumsy (s)he, his/hers, or the grammatically incorrect their and them when referring to the singular, I have used his and him. This has at least the approval of time.

## **ACKNOWLEDGEMENTS**

First and foremost, I must acknowledge the help and guidance of my external supervisor, Dr Noel Coley without whose continued support and suggestions this dissertation would never have reached completion. His knowledge and assistance have been invaluable to me. I must also thank my internal supervisor, Dr Peter Elmer for his help. Professor Colin Russell was also very kind with his initial encouragement to get me started.

I must mention the staff of the Library at the North Devon Hospital, in particular Mr Alan Pedlar: they have been tireless in helping me chase up obscure references and get hold of rare journals. Miss B Sutton and the librarians at the Wellcome Historical Medical Library<sup>b</sup> have been helping me since 1969 and continue to supply valuable assistance. I must also thank the Curator of Hall's Croft (Shakespeare Birthplace Trust) and the librarians at Exeter University, Plymouth University and the Royal College of Surgeons of England.

Finally for typing the manuscript which, I am sure has on many occasions gone beyond the call of duty, I must acknowledge my overwhelming debt of gratitude to Mrs Rosamund Marsh.

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<sup>b</sup> Latterly known as the Wellcome Library for the History of Medicine.

## **ABBREVIATIONS**

<b>AMH</b>	<b>Annals of Medical History</b>
<b>ASE</b>	<b>Anglo-Saxon England</b>
<b>BIHM</b>	<b>Bulletin of the Institute of the History of Medicine</b>
<b>BHM</b>	<b>Bulletin of the History of Medicine</b>
<b>BMJ</b>	<b>British Medical Journal</b>
<b>EETS</b>	<b>Early English Text Society</b>
<b>EMSJ</b>	<b>Edinburgh Medicine and Surgery Journal</b>
<b>ITS</b>	<b>Irish Text Society</b>
<b>JEGP</b>	<b>Journal of English and Germanic Philology</b>
<b>JMDU</b>	<b>Journal of the Medical Defence Union</b>
<b>JHM</b>	<b>Journal of the History of Medicine</b>
<b>JHMAS</b>	<b>Journal of the History of Medicine and Allied Sciences</b>
<b>MB</b>	<b>Medical Bookman</b>
<b>MMR</b>	<b>Marquette Medical Review (Marquette University)</b>
<b>NEJM</b>	<b>New England Journal of Medicine</b>
<b>NW</b>	<b>North Wing (Journal of Sheffield University Medical School)</b>
<b>PM</b>	<b>Philosophes Medievaux</b>
<b>PsM</b>	<b>Psychological Medicine</b>
<b>RdEL</b>	<b>Revue des Etudes Latines</b>
<b>RES</b>	<b>Review of English Studies</b>
<b>YR</b>	<b>Yale Review</b>

## REFERENCES TO PROLEGOMENON

1. GORELL, Lord. (1948) *The Essentials of Poetry*. Chapter XVII in *English Language and Literature*. Odhams, London. p.266.
2. YOUNG, J.R. (1968) "*Allusions to Medicine in Mediaeval Poetry*".  
NW. 31, 1, pp 7 - 9  
"*Allusions to Medicine in seventeenth Century English Poetry*".  
NW. 31, 2, pp 16-19.
3. YOUNG, J.R. (1980) "*Medicus Magus*". JHMAS xxxv, 1, pp 40-57.

## **INTRODUCTION**

### **i.1. POETRY AS A BAROMETER OF LAY KNOWLEDGE**

Study of the History of the Theory and Practice of Medicine has traditionally been based on contemporary medical tracts. If, however, the primary source material for any such historical research is contemporary poetry (both lyrical and dramatic) a valuable insight should be obtained into the level of knowledge of medicine in the educated layman rather than the professional physician. This premise is based on the assumption that poetry published during the period under study is written for the general public rather than any particular section of it.

The time-frame between the later mediaeval period and the end of the seventeenth century has been chosen for a number of reasons. For one thing, not a great deal of written English poetry has survived from before the fourteenth century, and consequently there are not a lot of primary sources. Furthermore the later fourteenth century was marked by an increase in the amount of literature in vernacular English. Levels of education in general were improving and broadening.<sup>c</sup> Towards the end of the period under consideration there was a great upsurge in progress in scientific and medical knowledge. If, therefore, my premise that the study of poetry can be used to gauge the diffusion of medical knowledge to the laity, then contemporary poetry of the latter half of the seventeenth century should tell us, for example, whether Harvey's theory of circulation has made an impact on the educated layman; poetry should also act as a similar index as to what extent advances in astronomy and germ theory have been generally accepted. Whereas the contemporary prose medical texts at the end of the seventeenth century would no doubt argue their ideas most convincingly (perhaps

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<sup>c</sup> LINDEN (1996) chooses 1385-1700 for his seminal study on allusions to alchemy in English literature.<sup>1</sup> He argues that *the earliest and possibly finest examples of alchemically-inspired literature is the Canterbury Tales*.

even using Baconian philosophy or Harveian hypothetico-deductive method), examination of the poetry of this period shows that a very definite scepticism to these revolutionary theories exists in the minds of the educated laymen. Such a study, therefore, offers a definite contribution to the student of the History of Medicine. Since poetry is written for a general audience, rather than for any one specific professional group, it acts as a barometer of the extent which current medical theories have percolated through into lay knowledge.

## I. 2. MEDICAL KNOWLEDGE IN SOCIETY

Classical traditions pervaded all late mediaeval philosophy and university teaching, and this was certainly true with respect to medicine. From the 12th century onwards the Classical teachings of the *Articella* by Galen and Hippocrates and the *Canon* of Avicenna had become available to the Universities and Medical Schools of Western Europe.<sup>2</sup> They were written in Latin, however, which remained the "language of physic" for many centuries (and was still associated with medical education in this country at the beginning of the 20th century). Latin was also associated with the Church and in the 14th and 15th centuries, priest and physician *could be one and the same man*.<sup>3</sup> During this period, concomitantly the number of people literate in English was growing rapidly<sup>4</sup> and Getz tells of an England experiencing *a remarkable upsurge in the amount of practical advice available to readers in the English vernacular*<sup>5</sup> beginning in about 1375. Among this advice the greatest growth was in the number of medical tracts written in middle English (rather than Latin). So much so in fact that she considers *Middle English medical literature ... (provided) vernacular access to the best of contemporary Latin medicine, through translations, excerpts and paraphrases*.<sup>6</sup> There had been medical writings in Anglo Saxon,<sup>7</sup> and Getz says that the vernacular medical tradition in England is the oldest in the world.

It is clear that many of the English medical and surgical texts are translations of Latin,



and as such they are not treatises on English folk-medicine but Classical medical teaching translated from the Greek and Arab physicians. On some occasions the practitioners were English who had published for their colleagues in Latin, and this was then translated into English by the clergy for the laity. An example of this is the well known tract of the 14th century surgeon, John of Arderne on the treatment of anal fistula.<sup>9</sup> His Latin version of 1376 was soon translated to Middle English and this was reprinted after around 1455 on several occasions. Getz gives an extensive list of vernacular surgical and medical texts<sup>d</sup>. She emphasizes the fact that the increasing number of English medical texts was an indication of a much wider lay audience avid for medical knowledge and asserts that *the motivation for at least some of these early translations remained rooted in the charitable impulses of the mediaeval preaching friars*.<sup>10</sup> In the fifteenth century she says that the medical text became a commodity and the translator an *entrepreneur of the likes of Caxton*.<sup>11</sup> This is perhaps a little unkind to Caxton, (1422-1492) who made a significant contribution to English letters. Caxton's extensive output of books were almost exclusively in the vernacular. He reckoned that Latin books could be imported and so he translated texts, but his greatest contribution was the part he played in our literary tradition. He printed Chaucer extensively and his publication of *The Canterbury Tales* is said to precede any editions of his translated books.<sup>12</sup>

We have therefore at the beginning of the sixteenth century, an England becoming much more literate. The availability of books written in vernacular English was very extensive and they were varied in their subjects. There was also a tradition (evidently going back as far as the Anglo-Saxon period but having undergone an upsurge around

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<sup>d</sup> With medical works she refers extensively to Gilbert the Englishman, and also Galen's *Methodus medendi*, Haly Abbas' *Liber regius*, Peter of Spain's *Thesaurus pauporum*, Copho's *De anatomia porci*, Gordon's *de Prognosticis*, Trevisa's *de Proprietatibus Rerum* and Aristotle's *Secretum Secretorum*. With respect to surgery, she quotes in addition to Arderne's work on *Fistula in Ano: Haemorrhoids and Clysters*, Chauliac's *Cirurgie*, Langfrank's, *Science of Chirurgie*, and other works by Henry of Mondeville, William of Saliceto and Roger of Parma. Phlebotomy tracts by Bernard Gordon and Henry of Winchester together with the gynaecology text of Trotula of Salerno are also cited.<sup>v</sup>

1375) of medical texts written in English for the laity. In addition to this, Middle English had become the language of poetry consequent principally on the work of Chaucer, *in general concurrence the greatest English mediaeval author*.<sup>13</sup> From what has been said, it is inevitable that there would be some knowledge of medicine by the layman of the late mediaeval period. Since this was concomitant with the period in which vernacular English poetry began to flourish, it is likely that by a study of these verses, some insight will be gained into the depth of the contemporary popular knowledge of medical ideas.

Moving on into the early modern period, handbooks on medicine were certainly available: Galen's shorter *Method of Healing* was expressly intended for the laity; Rufus of Ephesus' *opus majus* was entitled *The Layman*, and we know that translations of the late Latin handbooks of Marcellus Empiricus and Theodore Priscian<sup>14</sup> were aimed at the laity. Neither were these books rare: Slack (1979) calculates that vernacular medical books were so popular that if in 1604 all such published books were distributed equally among the population, there would have been one medical book for every twenty people.<sup>15</sup> (Although this statistic could well be criticised as perhaps being somewhat skewed, it nonetheless underlines the high incidence of published medical tracts).

In addition, the educated English layman would have a broad general education: he would certainly have a wide knowledge of classics, theology, law, medicine and philosophy. This universality of education certainly continued well into (and beyond) the Renaissance and is particularly evident in the works of Chaucer, and perhaps above all in Shakespeare. It has been said that Bacon wrote more medicine than law in his *Essays* and his *Advancement of Learning*, and that Rabelais wrote as much about law as of medicine,<sup>16</sup> but Francis Bacon (1561 - 1626) practised as a judge and an advocate, and François Rabelais (1483 - 1553) was a physician, although he is best

remembered by posterity for his satirical novels.

Although there were contributions from the Arabs, the classical teachings of Galen and Hippocrates were the basis of Western medical training in the late middle ages and indeed well into the Renaissance. Their underlying principles of medicine were not only intimately known by university trained physicians, but their ideas had been assimilated, *albeit with varying degrees of understanding across a broad spectrum of society.*<sup>17</sup>

Laymen with even a modicum of education would recognize and venerate the names of Galen and Hippocrates.

Medicine was inextricably linked with philosophy, and the concept of the animate intelligent universe made of the four basic elements, Earth, Water, Fire and Air, was the foundation of the humoral theory which was so fundamental to Galenic medicine. Because the whole macrocosm was alive and interrelated, man as a microcosm of the greater universe was in sympathy with it, and this cosmic sympathy is at the basis of the importance of astrology. The supremacy of astrology as an integral part of all university learning cannot be over-emphasized and was another crucial feature of Galenic medicine.

Theology was also intimately linked with medicine, and (despite the orthodox teachings of Galen and Hippocrates who refuted supernatural causes for disease) Christianity taught, and it was generally held, that the will of God was the principal cause of disease. The actual pathogenesis was thought to be then brought about by a change in the balance of the body's humours which were controlled by the heavenly bodies. Good health was thought to be a positive state, specific to each individual and consequent on that person's humoral make-up, diet, and horoscope.

### **i. 3. MEDICAL PRACTICE IN SOCIETY**

The universality of education described above underlines the fact that medical knowledge was widespread in early modern English society. It has further been suggested that interchange of medical information and the sharing of ideas about therapeutics was commonplace - even across the social barriers.<sup>18</sup> As outlined below, the practice of healing was hierarchical and healers of many differing types and grades were also broadly distributed through society. Both Getz (1998) and Pelling (1998)<sup>19</sup> point out the variety of therapeutic options open to the sufferer (and both refer to polarities rather than categories). This wide choice prompted Cook (1986) to coin the term, "medical marketplace",<sup>20</sup> which has subsequently been used to describe this diversity.\* Self medication based on local family superstition and also the vernacular literature is at the lowest end of the spectrum. Friends, family and the local gentry or clergy as well as the "wise woman" of the community might well also be asked for advice. This of course would be on a completely *ad hoc* irregular basis.

Of a more regular nature were healers who had other occupations: not only clerics had a sideline in the supply of medical advice. Net-makers and wax-chandlers were often also barber-surgeons.<sup>23</sup> There were also hosts of medical travellers, who again ranged from itinerant charlatans, mountebanks and quacksalvers to peripatetic (often foreign or jewish) doctors. So-called *ordinary medical practitioners* seemed to differ from qualified physicians only in the fact that they held no qualification; they served apprenticeships, were often family concerns and the remedies or receipts they used were sometimes handed down from generation to generation.

At the upper end of this very diverse scale were the three groups of accredited crafts

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\* Cook borrowed this term from George Bernard Shaw's "Doctor's Dilemma".<sup>21</sup> It has not found universal approval and is deprecated by Pelling.<sup>22</sup>

(who doubtless all liked to think themselves "professional".<sup>f</sup> These were the apothecaries, the (barber) surgeons and the physicians. It can be seen that this great variety led to a very complex situation in which the sufferer's choice of healer was very comprehensive. Neither were these practitioners rare: Pelling estimates that they existed in a ratio to population as high as 1:200.<sup>24</sup> It is therefore evident that the intense interest in matters medical at that time provided a ready audience for any poets making medical allusions.

The Reverend Ralph Josselin's diaries<sup>25</sup> are a meticulously kept record of the life of an Essex vicar (1616 - 1683). They give a fascinating insight into at least one 17th century life. It was mentioned above that the clergy often acted as amateur healers, and Rev. Josselin himself routinely practised uroscopy on the urine of his own family and that of his neighbours. Illness is mentioned in the diaries on 762 occasions, and in most of these the vicar relies on his own medical knowledge (he owned two vernacular textbooks) to offer advice. He only occasionally consults irregular healers, and almost never seeks the help of physicians and surgeons.<sup>26</sup>

The 16th century courtier and sceptic, Montaigne, disdained physicians. He studied French vernacular medical texts, understood Galenic humoralism and considered that he knew his own temperament and idiosyncracies better than any physician. He abashed the physicians attending the European spas by planning his own treatment regimens when he visited Swiss and Italian health centres in 1580-1.<sup>27</sup>

Most literate men and women would have a broad understanding of these principles. Although the more unpleasant morbid aspects of disease and death were generally avoided in English literature,<sup>28</sup> the philosophical aspects of humoralism, astrology and

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<sup>f</sup> They still do!

their relationship to health was certainly alluded to in contemporary verse. It can therefore be assumed that these concepts were within the grasp and understanding of the educated layman for whom they were written.

#### **I. 4. WHY POETRY?**

If Lord Gorell's quotation at the beginning of this dissertation is valid, then study of 14th century poetry (when English verses were first written down) to the time of the so-called Scientific Revolution should give an insight into contemporary life in general of that period. Particular study of any allusions to medicine should similarly give a special insight into the prevalent medical ideas.

Lord Gorell said that the *three dominant motives* in poetry were *Religion, Battle and Love* but over the years, there have been quite a few references to medicine and health which give us an index of the medical ideas prevalent in contemporary society.

Focusing on poetry as a window on the popular knowledge of medicine in early modern England reveals the extent to which current medical ideas had infiltrated public knowledge. Lyrical and narrative poetry was aimed primarily at the literate layman.

The very nature of, for example, the sonnet is intensely personal and intimate, although it may have been intended for publication or read aloud to a wider audience.

In contrast, dramatic poetry in its popular Elizabethan heyday was certainly not confined to the educated layman. Study of poetry in general then will illustrate the extent to which medical ideas had been accepted by and diffused into a public untutored in medicine, but nonetheless plagued and surrounded by disease. That public, then as now, had a morbid fascination with illness and death, and would certainly be interested in the explanations for and perhaps more importantly the possible cure of their maladies.

## **i. 5. AIM**

Radical changes in scientific thought in the middle of the 17th century, the age of the Scientific Revolution, took place concomitantly with the change in literary style in English Poetry: the lives of Edmund Spenser (1552 - 1599), William Shakespeare (1564 - 1616) and John Donne (1572 -1631) all overlap and as poets they are all completely different in their styles (for examples see 1.7). Sawday has recently proposed that the anatomical advances of Vesalius and the physiological discoveries of William Harvey are related to the changes in style of English verse.<sup>29</sup> I have examined poetry from Chaucer (1340 - 1400) to the later part of the 17th century and tried to show in the references I have collated, that such a study can be used as an index of the progress of medical ideas particularly as perceived by the laity. The aim then of this work as a study of the History of Medicine is broadly and simply to show that: *the study of English Poetry up to the end of the 17th century gives an insight into contemporary popular medical ideas.*

## **i. 6. PROBLEMS IN RESEARCH (a) PRIMARY SOURCES**

The major difficulty in writing this thesis has undoubtedly been in obtaining appropriate poetical references from primary sources. Particularly before the Renaissance, literary allusions to medicine are few and far between: Woolf has pointed out that in the Middle Ages,<sup>9</sup> there was no *actual popular taste for literature on the subject of death*,<sup>30</sup> and Wenzel has written a monograph on the scarcity of *English* literature about the Great Plague<sup>31</sup> (in particular contrast to contemporary Continental literature). It is noteworthy that Wenzel considers lyrics to be the best literary genre for research into the Black Death. Moreover, there are very few secondary references and with the sole exception of commentators on William Shakespeare, little has been written on this subject. To a great extent this has made the subject a fascinating one for me as a

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<sup>9</sup> by which he means the period from the fall of Rome (c. A.D. 495) until the Renaissance.

physician but it has also often meant much fruitless searching for poetic references to medical subjects. This means that much of the interpretation of the references cited is necessarily based on my own medical knowledge. Three main methods of garnering primary sources have been utilized. Annotated *Collected Works* have been the most useful sources of relevant extracts.<sup>h</sup> Scanning through *notes* sections - particularly when they are set out as "end-notes" with italicized words from the text - brings to notice medical references far more readily than searching the verses themselves. Similarly the use of *Concordances*<sup>i</sup> has been very useful; these are usually only available for the major poets, such as Chaucer, Shakespeare, Milton and Donne.<sup>33-37</sup> *The English Poetry Database*<sup>j</sup> and *Dictionaries of Quotations*<sup>38-40</sup> have also provided limited primary source material.

#### i. 7. (b) PHYSICIAN-POETS

Poets who had been trained as physicians were for the main part a disappointment in that although medically qualified, their poetry did not reflect this at all. Conversely, two poets George Herbert (1593-1633) and Robert Greene (1558-1592) though not medically qualified could be considered as belonging to the ranks of "ordinary practitioners". Herbert *saw medicine as a regular part of his duties as a rector*<sup>41</sup> and Greene *turned to medicine as a means of supporting his literary career*.<sup>42</sup> Physician-poets<sup>k</sup> such as Abraham Cowley (1618-1667), Henry Vaughan (1621-1695) Thomas Campion (1567-1620) and Thomas Phaer (1510-1550) were prolific versifiers but they make very few allusions to contemporary medicine in their works. They tend to follow

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<sup>h</sup> One such work is the *Complete Poems of Henry Vaughan*<sup>22</sup> in which 43% of the work is notes. Other annotated works are cited in the thesis.

<sup>i</sup> A Concordance is a book which gives an index of, and references to, the principal words used in a work, or by an author, alphabetically arranged, and with the full context cited.

<sup>j</sup> This is published on CD ROM by Cadwick Healey.

<sup>k</sup> for a list of fourteen medically qualified poets from *Biographical Dictionary of Renaissance Poets* see section I.9.



Lord Gorell's *dominant motives* and write (often in Latin verse) about Love and Religion, neglecting disease and therapeutics. They are certainly more preoccupied with beauty and man's moral universe than the more sordid aspects of illness which would have been their professional daily commonplace. Dr John Collop (1625-1676) however, is a medical poet who gives many references to his profession. He is a little known poet whose verses have only have achieved recognition in the twentieth century.<sup>43</sup> He often wrote *against the puritan sectaries* and stands out in his radical opposition to medical conservatism using his poetry as a vehicle for serious criticism of what he considered unproven dogma. He makes a number of attacks on the orthodoxy and has been quoted in this thesis extensively. (vide infra I.8; II.11; III.11, 12; V.10; VI.5; VII.9) It should be stated that Collop is not only writing for his medical colleagues, but for the educated seventeenth century layman. He wrote 24 medical poems<sup>1</sup> which were included amongst his 128 verses. Interestingly Drinkwater who "discovered" Collop in 1921 considers these medical poems as 'negligible' and says he was *preoccupied with two or three groups of subjects - political, amatory, religious*.<sup>48</sup>

#### i. 8. (c) THE NATURE OF POETRY

In the 20th century, it would be unthinkable for a serious medical tract to be written in verse (or in Latin), but clearly this has not always been the case. In the 17th century, Hobbes and Bacon urged against the use of poetic language in scientific dissertations (I.7); Hobbes contended that it *professed deceit*. He held that medical language needs must be explicit to be clear and unambiguous. This goes against the very nature of poetry which is almost by definition ambiguous and unclear for enhanced poetic effect. Poetic language is evocative and often oblique, sometimes juxtaposing spiritual ideas with physical concepts to imply rather than explicitly state. This, of course means that a poet might well use poetic language and even antiquated beliefs and philosophy to

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<sup>1</sup> A list of their titles is in POYNTER (1958)<sup>44</sup> and they are reproduced in full in HILBERRY (1958)<sup>45</sup>

enhance the literary value of a piece of verse: to give an example, even a 20th century poet may say that someone is *in the arms of Morpheus* or that they *have been struck by Cupid's arrow*, or even when it thunders that *Thor is striking his mighty anvil*, without any conviction or credence in the mythological metaphors he is using. It might well be that when Shakespeare says in *Romeo and Juliet*,

.....through all thy veins shall run

A cold and drowsy humour,<sup>47</sup>

he similarly has no conviction that the veins are really full of black bile but because poetry is evocative and allusory rather than prosaic and factual, he is merely using this form of language to invoke poetic imagery and associations from the past to enhance his literary effect. Surely this is not the case in this instance and the cleric-physician would almost certainly believe in humoralism which was still being taught in the medical schools (vide II.8). *Romeo and Juliet* was written in 1596, and in 1655 the Galenic humoral theory was described in *Institutiones Medicae*, an acknowledged contemporary textbook as *certis, firmis et indubitatis*<sup>m</sup> (vide II.8).

Let us follow on using the example of Shakespeare, on whom I have relied heavily throughout this thesis to support my argument that the study of English poetry gives a good insight into contemporary popular medical ideas. In addition to his references to the Galenic humours and elements (II.7), he has spoken of the influence of the stars on disease (III.7); he has described miasma, contagion, and the signs, symptoms and treatment of the Great Pox (IV.8, 9); he has mentioned, tongue-in-cheek, the quackery of uroscopy (VI.4) and alluded to the practical considerations of blood-letting (VII.6, 7). He has done all of these things in wonderful English poetry, evoking imagery and using archaic language. It is most unlikely he would have made use of these concepts, however, if they had not been well known to his wider audience: for one thing, his

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<sup>m</sup> sure, firm and not open to any doubt

jokes would have fallen flat. Many of his medical references are quite salacious and this bawdiness is likely to have been calculated to appeal to the vulgar rabble in the theatre: again these would have missed their mark had he not been sure that ordinary Elizabethans would have been aware of their meaning. Gorell has said a poet is the *interpreter of his age*, but Ben Jonson said of Shakespeare, he is *not of an age, but for all time*.<sup>48</sup> Shakespeare, whatever else he may have been, was certainly an Elizabethan, and as such delights us as the interpreter of the Renaissance in which he lived.

He does, of course, use medical terms metaphorically (see also V.7); *Prospero* says of *Antonio*

*whom to call brother/Would infect my mouth*<sup>49</sup>

and when *Lady Anne* spits at *Gloucester*, she adds,

*Out of my sight, thou dost infect my eyes*.<sup>50</sup>

In both of these examples, the word *infect* means *taint*, and a contemporary theory of infection (vide IV.5) used the analogy of dyeing cloth. By using the word *infect* metaphorically, Shakespeare evokes imagery and achieves a much more powerful impact. It is usually obvious when medical metaphors are used. In practice, the poetic licence which allows poets to elicit associations through cultural or historical awareness in the way described above, has not caused any confusion and it has been a theoretical rather than a real problem, the beauty of the poetry more than making up for any slight ambiguity which poetical metaphors and imagery may have caused.

## **i. 9. RATIONALE**

(a) Choice of Topics The topics examined do not claim to be an exhaustive list of all subjects in pre-Renaissance and 17th century medicine. This would clearly be beyond the scope of this work.

**My chosen topics are:**

- 1. Man, the Microcosm**
- 2. Humoralism**
- 3. Astrology**
- 4. Contagion**
- 5. Circulation of the Blood**
- 6. Uroscopy**
- 7. Phlebotomy**

**First and foremost the choice of these categories is entirely pragmatic, for frankly these are the only topics for which I have been able to find sufficient primary references.**

**Secondly, and perhaps consequent on the first reason, the first four of these topics are philosophical issues, and medicine was linked with philosophy throughout the period studied. Poets are more likely to write about man's relationship to the universe than the terminal stages of leprosy. Humoralism, too, was linked with an individual's temperament and lent itself to poetical expression. Astrology was of such great importance to the mediaeval mind that Chaucer, Shakespeare and others alluded it.**

**It was stated above that a Chapter on the Circulation of Blood was included because I was able to find sufficient references to it. Uroscopy and Phlebotomy are included again principally because it was possible to find enough appropriate allusions. Indeed Uroscopy was one of the mainstays of diagnosis - so much so that the urinal became the symbol of the physician.**

**With respect to phlebotomy, this also includes the concept of humoralism and astrology, and perhaps for these reasons, references to bloodletting were not too difficult to find. Other surgical subjects are not included, e.g. lithotomy, bone-setting, trephining, dentistry and the treatment of wounds. Brief mention is made in some**

chapters to herbalism (I.5;II.6;V.4), chymical medicine (II.7,9.), and alchemy<sup>n</sup> (II.9,11) but it was not possible to obtain enough references for a chapter.

Why the poets chose the subjects above, and left other medical topics alone ( and here the obvious example is the poorly explained vacuum of information available in poetry about the bubonic plague) is discussed in the conclusion.

(b) Footnotes In the main, I have used footnotes to translate middle English or Latin quotations, or give additional explanations of the text.

(c) Endnotes In citing quotations from plays, I have used the convention of numbering the Act in Roman capitals and the Scene in arabic numerals; thus Act III, Scene 4, lines 21 to 25 becomes III, 4, 21-25. References to Chaucer use the Skeat Convention.<sup>51</sup> In references to journals, the volume number is underlined, so that MMR.28, 1, pp 35-36 refers to *Marquette Medical Review*, volume 28, part 1, pages 35 to 36.

(d) Italics Italic lettering has been used (without inverted commas) in the main text to indicate quotations. Longer quotations are indented in blocks. Italics are also used for the titles of works in the Endnotes.

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<sup>n</sup> In this respect, I am not directly at variance with Linden (1996) who has written a book on Alchemical allusions in literature during the exact period under study (ref.1) In Linden's excellent and thorough study, the majority of his alchemical allusions are non-medical and most are in prose rather than verse. Linden highlights the satire which is poured on exoteric or physical alchemy during this period, starting with Chaucer in the *Canon Yeoman's Tale*. He points out with some regret that most poets are concerned with ridiculing the charlatans and concludes *alchemy's literary potential was greatly diminished through the restriction of its meanings and associations*.

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# CHAPTER I

## ON MAN, THE MICROCOSM IN THE UNIVERSAL ANALOGY

*Man is no microcosm, and they detract*

*From his dimensions who apply*

*This narrow term to his immensity<sup>1</sup>*

Ralph Knevet (1636)

### **I. 1. THE CHAIN OF BEING<sup>a</sup>**

In *The Elizabethan World Picture*,<sup>b</sup> Tillyard divides his *World Picture* into three: a *Chain of Being*, a *Network of Correspondences* and a *Cosmic Dance*.<sup>2</sup> Firstly, the *Chain of Being*, has five links;

- |      |                            |
|------|----------------------------|
| I.   | Angels and Ether           |
| II.  | Stars and Fortune          |
| III. | Elements                   |
| IV.  | Man                        |
| V.   | Animals, Plants and Metals |

All these constituent parts of the Universe were thought to be animate. This view of the whole of Creation had been inherited from the Middle Ages, but the concept of an animate universe had existed since the time of Thales of Miletus (fl. 6th Century B.C.)

Collingwood reminds us that:

*Greek natural science was based on the principle that the world of  
nature is saturated or permeated by mind... the world of nature is*

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<sup>a</sup> This term, the *Chain of Being* was used by Alexander Pope in his *Essay on Man* (1734),  
*Vast Chain of Being I which from God began,  
Nature's Ethereal, Human, Angel, Man,  
Beast, Bird, Fish, Insect,*

It was also the title of a book on Elizabethan philosophy (Lovejoy, Arthur O. 1936. *The Great Chain of Being* Cambridge, Mass.)

<sup>b</sup> Tillyard admits to using the term Elizabethan "with great Laxity, meaning anything within the compass of the English Renaissance, anything between the ages of Henry VIII and Charles I akin to the main trends of Elizabethan thought".

*not only alive but intelligent; not only a vast animal with a "soul" or life", but a rational animal with a "mind" of its own.<sup>3</sup>*

The world was not just like an animal, it was an animal. John Donne alludes to this in one of his most popular poems, *A Nocturnall upon Saint Lucies day, being the shortest day*, when he says,

*..... Yea plants, yea stones detest*

*And love, All, all some properties invest.<sup>4</sup>*

Donne is here overstating this hylozoistic principle, surely for poetic emphasis. He says that not only are *plants, stones*, and indeed *all* endowed with life, but goes further and tells that they even show the emotions of hate and love. (The souls of plants and animals are discussed below in IV.1). The form of this animate Universe, described in Plato's *Timaeus*,<sup>c</sup> was a series of spheres, centred on the Earth. This concept of a geocentric universe described by Plato, and later by Aristotle and Ptolemy with the Earth at the centre was simple and readily intelligible. It is worth mentioning that this wholly feasible idea had been the commonly accepted view throughout the middle ages, and for that matter long after the alternative but much less easily understandable notion of heliocentricity was proposed by Copernicus' work, *de Revolutionibus* in 1543. Controversy gathered momentum at the end of the 16th century with contributions from Thomas Digges, Kepler and Galileo. The debate was far from settled however, and to the mind of the educated 16th century, and for that matter 17th century man, the jury was still out on the concept of heliocentricity.

Milton refers to these spheres in his poem *Arcades* (1633): the *Genius of the Forest* speaks of,

*..... the celestial Siren's harmony,*

*That sit upon the nine enfolded sphears.<sup>5</sup>*

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<sup>c</sup> The *Timaeus* or *Timaeos* referred to here is the book written by Plato rather than the Greek historian of the same name (c. 356 B.C. - c. 260).

In *Brewer's Dictionary of Phrase and Fable* whose emphasis rests on literary rather than scientific interpretations, the entry for *Spheres* says:

*In the PTOLEMAIC SYSTEM of astronomy the nine spheres were those carrying*

i) *DIANA or the MOON*

ii) *MERCURY*

iii) *VENUS*

iv) *APOLLO or the SUN*

v) *MARS*

vi) *JUPITER*

vii) *SATURN*

viii) *the fixed stars - the Starry Sphere and*

ix) *the CRYSTALLINE SPHERE - introduced by Hipparchus, to*

*account for the precession of the equinoxes. The PRIMUM MOBILE was added in the MIDDLE AGES.<sup>6</sup>*

John Donne later compares these *nine enfolded spears* more starkly, almost akin to a set of Russian dolls! He says,

*This is Nature's nest of boxes. The Heavens containe the Earth, The Earth cities, Cities men, And all these are concentrique.<sup>7</sup>*

Donne's departure from archaic poetic language is immediately apparent. The term *macrocosm* was usually applied to the universe. In contrast, the term *microcosm* was used to denote the *little world* or Man himself. Nicolson also introduces the term *geocosm*, which specifically means the Earth. It fits nicely into Donne's *Nature's nest of boxes* concept in her analogy of the chain of being as a series of circles. She alludes to:

*the mystical interlocking pattern of Timaeus: the universe a great series of circles, the globe a lesser circle, the head of man, seat of*

*human reason, a little copy of the Great Circle in its roundness.*<sup>8</sup>

The above references show that man was considered to be an integral part of a hylozoistic cosmos.

## **I. 2. THE OUTERMOST LINKS OF THE MACROCOSMIC CHAIN**

Beyond the outer sphere of the stars, God was domiciled in the *coelum empyraeum*<sup>d</sup>:

Milton is talking of this in *Paradise Lost*:

*Now had the Almighty Father from above,*

*From the pure Empyrean where he sits*<sup>10</sup>

There was another important boundary in the macrocosm, and that was below the sphere of the moon. The sublunary region was subject to death and decay, but the heavens and all above the moon were eternal and perfect. The sublunary sphere even included the earth which was itself perceived as mortal and susceptible to decay and death.

The five "links" in E.M.W. Tillyard's Chain of Being are given above. Below the uppermost link of the *Angels*, he cites *Stars and Fortune*. This was the basis of the importance placed on astrology, which had been so important in the Middle Ages. It was thought that the "stars" (i.e. planets) by following God's unfaltering order were responsible for the fortunes of creatures in the regions below the moon. *The planets were the commuting agents of eternity to mutability.*<sup>11</sup> If the whole universe was animate, inter-related and moreover rational and intelligent, movement of the planets causing a change in the fortunes of creatures which are other parts of the same vast Universe becomes more readily intelligible.

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<sup>d</sup> According to Ptolemy<sup>9</sup>, the fifth sphere of heaven is called the *caelum* (or *coelum*) empyrean. *Caelum* is Latin for heaven and the word *empyrean* comes from the Greek *en-pur*, in fire and is pure elemental fire (see Cap. II)

### I. 3. A LITTLE WORLD MADE CUNNINGLY

John Donne said in one of his most familiar *Holy Sonnets*,

*I am a little world made cunningly  
Of Elements....*<sup>12</sup>

In his poem, *Man*, George Herbert says,

*Man is one world,  
And has another to attend him*<sup>13</sup>

It was stated above that this little world of Man was referred to as the *microcosm*.

John Milton in *Paradise Regain'd*, refers to *Man's lesse Universe*.<sup>14</sup> This correspondence between microcosm and macrocosm is certainly very old. Although it has been attributed to Pythagoras and Plato, its origins are lost in antiquity.

Shakespeare refers to men as Worlds in *Cymbeline* when *Princess Imogen* is reminded that the discovery of her long-lost brothers has lost her a kingdom (for she had hitherto been the only heir to the throne), she contradicts,

*No my lord,  
I have got two worlds by't.*<sup>15</sup>

Henry Vaughan, wrote in 1678:

*Thou art a world, thy self along,  
Yea, three great worlds refin'd to one.*<sup>16</sup>

The terms *microcosm* and *little World* were used both humorously and seriously by other contemporary writers.\*

It is important to realise the interlocking spheres were not only animate and concentric

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\* Robert ALLOTT (1599) *Wits Theater of the Little World*; CROOKE, Helkin (1616) *Microcosmographie: A Description of the Body of Man*; HEYLN, Peter (1616) *Microcosmos: A Little Description of the Greet World*; EARLE, Jno. (1628) *Microcosmographie or a Piece of the World Discovered in Essays and Characters*; WANLEY, Nathaniel (1678) *The Wonders of the Little World or a General History of Man*.

but interrelated and interdependent. The fundamental concept of this interrelationship of the little world of man, and the greater worlds of the Earth and the Universe was basic to pre-Renaissance thought. An often quoted example of this interaction between microcosm and macrocosm is found in *King Lear*, (1605) and this certainly serves as an excellent example of the philosophical concept. The Bard sets the scene on a storm-wracked heath *with thunder and lightening*. Kent is asking the whereabouts of Lear. The answer is:

*Contending with the fretful elements;*

*Bids the wind blow the earth into the sea,*

*Or swell the curled waters 'bove the main,*

.....

*Strives in his little world of man to outscorn*

*The to-and-fro conflicting wind and rain.<sup>17</sup>*

We see at once the tempestuous forces in the macrocosm are mirrored in the mental tumult taking place in Lear's little world of man or microcosm. Later Lear addresses Nature thus:

*Blow, winds, and crack your cheeks! rage! blow!*

*You cataracts and hurricanoes, spout<sup>1</sup>*

*Till you have drenched our steeples, drowned the cocks!*

*You sulphurous and thought-executing fires,*

*Vaunt couriers to oak-cleaving thunderbolts,*

*Singe my white head! - And thou all shaking thunder*

*Strike flat the thick rotundity of the World!*

*Crack Nature's moulds, all germens spill at once,*

*That make ingrateful man!<sup>18</sup>*

Here we see chaos raging in both microcosm and macrocosm. The two reactions are

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<sup>1</sup> *Cataracts* implies waterspouts from heaven; *Hurricanoes* is an emphatic form of hurricanes; *cocks* means weathercocks and this implies a flood; *nature's moulds* are the metaphorical moulds from which living things are made; *germens* are seeds, and *spill* means destroy.

interdependent, but which is cause and which is effect? They are almost consequent upon each other. Here Lear is talking to the animate macrocosm. Although the king is calling on thunder to destroy the fertility of the world, he uses language suggestive of the sexual organs of men *for he wishes the human race to be abolished*.<sup>19</sup>

In this section, five 17th century poets give us references to the *little World* of Man: indeed the term itself is taken from John Donne. Shakespeare goes on to underline the concept of the indissoluble relationship between that little world or microcosm and the greater macrocosm in the reference from *King Lear*. These examples reflect the contemporary conception of man's place in the great Chain of Being.

#### I. 4. THE UNIVERSAL ANALOGY

Salingar implies that Shakespeare has included the macrocosm in the *dramatis personae* for *Coriolanus* and *Othello*. Rather than limiting his cast, Shakespeare enlarges it so as to extend the tragic conflict continuously from our hero's mind towards the outer limits of the cosmos.<sup>20</sup> It equally applies to the example quoted from *Lear* above. In *Pericles*, too Shakespeare uses a storm to demonstrate the Universal Analogy. Pericles' wife, Thaisa, is dying on board ship during a storm, and in childbirth. Pericles believes the tempest to be the will of the gods, and hails the birth of his daughter thus:

*Now, mild be thy life!*

*For a more blustrous birth had never babe;*

.....

*Thou hast as chiding a nativity*

*As fire, air, water, earth, and heaven, can make,*<sup>21</sup>

This is not only Shakespeare's art, but a true belief that the elements are taking part:

Traversi comments:

*Behind ..... this prayer for peace lies the Shakespearean*



*intuition of subsequent continuity, the sense that birth and death, tempest and following calm, are in reality aspects of a single process to which the elements themselves "fire, air, water, and even "earth and heaven" -are in their universal presence, witnesses.<sup>22</sup>*

The great physician/philosopher/theologian Dr Thomas Browne (1605 - 1682) gives us many references to this Universal Analogy in this famous work, *Religio Medici*. In this book, he uses the term *microcosm* freely:

*Whilst I study to find I am a microcosm, or little World, I find myself something more than great. There is no man alone, because every man is a Microcosm and carries the whole world with him.<sup>23</sup>*

#### **1.5. THE DOCTRINE OF CORRESPONDENCES**

In the description above of Man's place in the Chain of Being, it has been convenient to describe the "Chain" as a vertical metaphor. God and his Angels are above, the planets are under this; the geocosm is below the sublunary plane, and man is lowest of all on the earth.

The doctrine of *Correspondences* examines horizontal connections between these vertical planes, and the pre-Renaissance world had an infinite network of these. One correspondence which has already been examined in this chapter is the macrocosm/geocosm/microcosm analogy of spheres.

Dr. Thomas Browne said of the three concentric spheres that man was a copy of his Earth, and this in turn a copy of the Universe, and all these three are *epitomes* of God. The Book of Genesis tells that *God created man in His own image: in the image of God created He him.<sup>24</sup>* That God's pattern is eternally repeated in macrocosm, geocosm

and microcosm is implicit in the classical theory of Universal Analogy:

*Man's head was a copy of God and the Universe, not only in its shape, but in its being the seat of reason. Man the epitome of God and the World was rational; so were the world and the Universe, into which God had imparted some of His own rationality. Each of the three worlds had its individuality yet each was involved with the others, and all partook of God.<sup>26</sup>*

Together with the concept of *epitomes*, the idea of *correspondences* and *signatures* also evolved from the Universal Analogy and is perhaps an indication of mediaeval man seeking some key to the unity between the three worlds. Dr. Thomas Browne talked of the *secret magic of numbers* and numerology is perhaps the most basic form of correspondence. Pythagoras had pointed out that all things can be expressed in numerical terms because they are ultimately reducible to numbers. Let us consider the correspondences of the number seven: there were seven planets, seven notes in the harmony of the spheres, seven days of Creation, seven ages of man, seven virtues, seven deadly sins, seven Wonders of the World, seven sages, even seven gates of Thebes.

Correspondences and signatures were often very obscure: all the metaphysical poets allude to correspondences in their works, and John Donne, for example, in his religious fervour finds the crucifix repeated everywhere in Nature:

*Who can deny mee power, and liberty  
To stretch mine armes, and mine owne Crosse to be?  
Swimme, and at every stroake, thou art thy Crosse;  
The Mast and yard make one, where seas do tosse.  
Looke downe, thou spiest out Crosses in small things;  
Looke up, thou seest birds rais'd on crossed wings:*

He then even goes on to give us an anatomical reference by saying that the sutures of

the skull form a Cross:

*As the brain through bony walls doth vent*

*By sutures which a cross form present*<sup>26</sup>

This last allusion is a *signature* which is an extension of the correspondence idea. The signature was explained by Sir Thomas Browne thus:

*I hold moreover that there is a phytognomy, or physiognomy not only of Men, but of Plants and Vegetables, and in every one of them some outward figures which hang as signs or Bushes of their inward forms. The Finger of God hath left an inscription on all his works.*<sup>27</sup>

Perhaps the best example of a signature is cited by Henry More, (1614 - 1687) who tells us:

*Wall-nuts bear the whole signature of the Head<sup>d</sup>. The outward green cortex answers to the pericranium, and a salt made of it is singularly good for wounds in that part; as the Kernel is good for the Brains, which it resembles.*<sup>28</sup>

Allegories of human anatomy had been used earlier in Spenser's *Faerie Queen* (1589) when it is compared to a Castle, the *House of Alma*.<sup>29</sup> Two lesser known poets, John Davies of Hereford and Robert Underwood also compare the body to architecture. Davies wrote in great anatomical detail in some of his poems (notably *Mirum in Modum* and *Microcosmos*). Underwood wrote a poem called *The Little World* in which he describes the body as,

*A Cittie large of,....a thousand thousand houses.*<sup>30</sup>

None of these are correspondences of the Earth, however. This is certainly done by Phineas Fletcher who finds the most obscure *correspondences* and *signatures* in his poem *The Purple Island* in which he racks his imagination (and that of his reader) to find analogies in the geocosm for almost every part of the microcosm. Fletcher wrote this epic poem in 1633. He allegorizes the body as an Island, nourished by rivers known as *veins* and *arteries*. The principal cities are imaginatively corresponded to the

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<sup>d</sup> It is interesting to note that St Augustine had previously considered the walnut to be a correspondence of Christ: *The outer green case was the flesh of Christ, the shell the wood of His cross and the kernel, His divine nature.*

*Head, the Heart and the Hepar* (liver). The book is a fascinating compilation of allegorical correspondences in which, for example, the intercostal muscles<sup>h</sup> are described as:

*A Guard, both for defence and respiration,*

*Of sixtie-foure, parted in severall bands:*

The diaphragm (or *Diazome*) is ...*a balk, a crosse-built wall*. The breasts or *paps* are predictably, mountains where intriguingly Cupid hides:

*Here lurking Cupid hides his bended bow;*

*Here milkie springs in sugred rivers flow;*

*Which first gave th' Infant Isle to be, and then to*

*grow.*<sup>31</sup>

Fletcher's surprising knowledge of Galenic anatomy together with some contemporary Renaissance developments has been noted by both Pohlman (1907) and Lambert (1931).<sup>32</sup> More recently Sawday has suggested that Fletcher (who was a high puritan) wrote the poem not just as an *incongruous fusion of poetry and science*, but as anti-Catholic propaganda. He also points out that the *Purple Island* is one of the last great examples of the tradition of poetic correspondence.<sup>33</sup>

These are at one end of the spectrum: at the other pole is the much older correspondence of Empedocles' haemodynamic theory with the ebbing and flowing of the tides often ascribed (wrongly) to Galen (see Capit. VI). In parallel with correspondences and signatures are *epitomes* and *abridgements*. In Phineas Fletcher's *Purple Island*, the *blessed Isle* is not only the human body, it is also an epitome (or small copy) of England. Books were seen as epitomes. Donne wrote:

*The World is a great Volume, and Man the Index of that Booke; Even in the  
Body of Man, you may turn on the whole world.*<sup>34</sup>

The cavalier poet, Richard Lovelace (1618 - 1657) even found an epitome of *our Politick World* in the curled shell of a snail.<sup>35</sup> With respect to medicine, this concept of

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<sup>h</sup> The intercostal muscles are those between the ribs (latin *inter*, between and *costa*, rib; they are important in both protection of the thoracic organs and more especially in respiration.

correspondences has two relevant points: it has already been alluded to in the passage on walnuts above by Henry More that it was considered God had put the signature on the plant to indicate for which part of the body, the plant provided a herbal remedy. The walnut cortex was therefore thought to be efficacious in head wounds. *Quinces* said More, *are a downy and hairy fruit; what more logical than a 'decoction of quinces' should prove good for the fetching again Hair that has fallen?* Scorpion grass, formed like the crooked tail of a scorpion, should prove specific against the bites of poisonous insects; Adders tongue, and indeed all speckled plants with spots like the spotted skin of snakes, were antidotes for snake bite, and soothing in the case of stings.

*Pulmonaria* or *lungwort* is likewise thought to carry the signature of the lungs and to be useful in pulmonary disease. *Heartsease* is thought to be helpful in cardiac complaints. The poetry then of Donne in the *Crosse* and Phineas Fletcher's *Purple Island* refers to the contemporary anatomical belief in correspondences and signatures, written by God's hand on His copy, man. George Herbert refers to botanical signatures in his poem, *Providence* in which he lists herbal remedies, after first pointing out the corresponding horizontal plane between herbs themselves and man:

*Herbs gladly cure our fleshe because that they  
Find their acquaintance there.<sup>36</sup>*

The second relevance of the doctrine of signatures to medicine is the mediaeval practice of therapeutic *image-making* which is a combination of astrological forces together with the power of signatures (see Capit. III).

## I. 6. THE NEW PHILOSOPHY

The seventeenth century was, above all, a time of great change. Collingwood described three main ages of European thought: the Classical, the post-Renaissance and the Modern. He posited that the idea of the Classical Universal analogy, which has also been described above as the macrocosm/microcosm correspondence lived on into the Renaissance and even into the Modern Period, albeit with a change in

emphasis during each era.<sup>37</sup>

This evolution of the analogy is certainly a most interesting concept. It was at the beginning of the seventeenth century that the old Greek concept of an animate - or even animal - Universe began to change. The crux of this antithesis in thought was the rebuttal that the World was an organism - a sort of seething ferment of yeast - by the new Cartesian idea that it is devoid of life and intelligence, but is in effect a mechanism or machine.

Copernicus' work *de Revolutionibus* (1543) and his concept of a heliocentric universe was briefly mentioned above (I.1). Copernicus had proposed an interesting theory as a challenge to the geocentric universe of Ptolemy, but as yet it was worthy of consideration, but lacked proof. Galileo's discoveries with the telescope (1632) supported Copernicanism, but his evidence was circumstantial. Their suggestions were certainly by no means generally accepted and most people continued to accept the old universe of Ptolemy which they integrated with their religious beliefs, and which had the support of the church.

Telesio inaugurated the Renaissance Empiricist reaction against the practice of reasoning without concrete data. In 1586, he posited that evidence from studying natural phenomena and experiments should replace the Aristotelean emphasis on conceptual analysis without reference to hard facts or *sense data*. Bruno too rejected the geocentric macrocosm in favour of a Copernican *heliocentric* (sun-centred) model, but went beyond this in positing an infinite macrocosm and a multiplicity of worlds in 1584. Two alterations to Copernican theory were posited by Brahe (1546 - 1601) and Kepler (1571 - 1630). Brahe devised a compromise to helio-and geo-centricity in which he suggested that the planets revolved around the sun, but the sun itself (with its orbiting planets) revolved around a central stationary earth. This was called the *Tychonic Compromise* (1597). Kepler, Brahe's assistant made further suggestions in 1609 and 1618: he proved mathematically that the planets including the earth orbited

not in circles but in ellipses in a heliocentric system.

Nicolson (1960) suggests that during the Elizabethan era these important discoveries had been accepted and as her title suggests that the concentric circles of the old macrocosm had been "broken" by the *New Science*. She says:

*The World of Aristotle ... was gone. In its place was only a lesser planet, turning on its axis, taking its orderly way among the other planets, moving about the Sun which had usurped the "proud Centre" that had for centuries been the World of Man.*<sup>38</sup>

This is surely an overstatement: as yet nothing was cut and dried. Elizabethan man was still waiting for proof. What had been broken, however, was the indisputable certainty. This had received a number of powerful challenges from the new discoveries. The firm earth at the centre of God's creation in the concentric universe was no longer incontestable. Many other possibilities had been made available, if not yet proven. Moreover, and very importantly the significant Renaissance concept of not accepting dogma blindly, but demanding what Telesio had called *sense data* (concrete evidence) had been introduced.

A problem which had always existed with a living animate World, was that if it was living, it could die, and this indeed is what was expected to happen (and in fact what metaphorically did happen in the Renaissance). The geocosm was thought to be moribund by Martin Luther: in 1560, he wrote *It is my firm belief .. the World will perish shortly.*<sup>39</sup> Sir Thomas Browne in *Religio Medici* said *I believe the World grows near its end*. Phineas Fletcher tells us of the irony that so many new geographical discoveries are being made so shortly before the End of the World. In the *Purple Island*, he writes,

*The aged world, though now it falling shows,  
And hastes to set, yet still in dying grows.*<sup>40</sup>

Fletcher was a puritan, and their view that the end of the world was nigh was

associated with anti-Catholicism.<sup>41</sup> John Donne, as part of his general obsession with death and dying,<sup>1</sup> includes the mortality of the Earth:<sup>42</sup> the subtitle of the *First Anniversarie* is *An Anatomy of the World. Wherein, by occasion of the Untimely Death of Mistress Elizabeth Drury, the frailty and the Decay of this Whole World is Represented*<sup>43</sup> was associated with anti-Catholicism. This *millenarian* outlook was based on the Biblical prophesies in the Book of Daniel (Cap.XII,verse 4) that the World was approaching a cosmic watershed, and that great cycles of history were about to climax in a Utopian reward for the righteous, but uncompromising retribution for the ungodly. They had even set the dates for the supposed millennium at either 1666 or 1694. They believed that the new geographical discoveries were an indication of the glorious forthcoming millennium and that the rapid developments in scientific knowledge were a spur for further action and inspiration for their approaching eventual reward.<sup>44</sup> Francis Bacon wrote the *Instauratio Magna* in 1626 and this was seized upon by the millenarians as a basis for their philosophies: ironically Bacon died that same year and so it was never finished.

It was these revolutionary changes in the concepts of the Universe with the certainty of the old theory of the macrocosm gone forever, together with other new and perhaps confused ideas of the geocosm which prompted John Donne to write:

*And new Philosophy calls all in doubt,  
The element of fire is quite put out;  
The sun is lost, and th' earth, and no man's wit  
Can well direct him where to look for it.*<sup>45</sup>

We saw above how Donne had used the analogy of the *concentrique* spheres, but in his poem *The First Anniversary* (in which his margin note refers to *weaknesse in the want of correspondence of heaven and earth* he talks of the dying world which, *did ... from the first houre decay*.<sup>46</sup> His nest of boxes is destroyed: the macrocosmic sphere

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<sup>1</sup> Donne's use of anatomical and medical imagery, particularly with respect to death is fully explored in Jonathan Dollimore's *Death, Desire and Loss in Western Culture*.<sup>42</sup>



is cracked if not broken and the sphere of the geocosm is sickening and suffering the *Decay of nature in other parts*.<sup>47</sup> The New Philosophy has called everything in doubt, even the world and the Sun. This poem of Donne's is a desperate cry for guidance in the bewildering New World, but that New World itself is moribund and on the verge of decay.

Although the poetical allusions in this section make no reference to medical ideas, the exciting uncertainty of the period is certainly emphasized by Donne. Whilst both he and Phineas Fletcher are clearly considering a possible apocalypse, they are nonetheless stimulated and bewildered by the wealth of the new discoveries all available for their contemplation. The new concept of refusal to accept old, or indeed new, ideas without hard facts to substantiate them was preparing the Renaissance mind for further revelations including important anatomical and physiological ones which were first published during the middle of the sixteenth century.

## I. 7. THE NEW LANGUAGES OF POETRY AND SCIENCE

The whole of the Elizabethan age in Britain was very complex:<sup>1</sup> on the one hand, the country was just realizing the fullness and richness of life brought about by the increasing communications with Europe and the blossoming artistic Northern Renaissance; there was a new patriotic enthusiasm growing around Good Queen Bess and fired by the War with Spain. On the other hand, was the fear of squalor, poverty and death which could be seen in abundance in all the major towns (especially the metropolis) and in between these two extremes, the floodgates of intellectual progress had been opened, giving rise to another conflict, between the *New Philosophy* and the old. Astrology, so important in mediaeval thought was being replaced by astronomy. Martin Luther and King Henry VIII had left religion in a state of turbulence. In the *Elizabethan Literary Renaissance*, Salinger points out that in the mere thirty years during Shakespeare's career as an actor, an entire literary revolution had taken place in

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<sup>1</sup> This is a long standing topic among historians of culture, and is fully explored by COLIE, N. (1966) *Paradoxica Epidemica: The Renaissance Tradition of Paradox*. Princeton Univ. Press. Princeton.

England;<sup>48</sup> it was the culmination of Edmund Spenser's heroic idealism with the overwhelming masterpiece of English lyrical poetry, *The Faerie Queen*; these were the years when Ben Jonson wrote his satires; this was also the period when Francis Bacon made his historic contemplations about the philosophy of science; this was the time when John Donne, the first of the so called *metaphysical poets*, devised a new style of poetry. Before William Shakespeare came to London, Philip Sidney had written in this *Apology for Poetry* in around 1583 that he had little optimism for modern English,<sup>49</sup> but less than even a contemporary life-time later, in 1613 after Shakespeare had written his last play *the literature of modern English was already rich in varied achievements, self-confident and mature*. In the preface to *The Renaissance in England*, (1966), J.V. Cunningham says that in the last years of the 16th century English poets developed a *new plain style modelled on the plain style of Latin antiquity*.<sup>50</sup>

Not only the language of literature, but also the language of science was changing.

*Since the seventeenth century, the paths of literature and science had divided ...In Shakespeare's day, there was little distinction between styles, often none between prose and poetry, certainly only the rudiments of any self-conscious separation between the language of a poet and that of a scientist. Kepler ...often spoke like Dante on the one hand, Marlowe on the other. The language of poetry and of science was one when the world was one.*<sup>51</sup>

Francis Bacon had complained in the *Advancement of Learning* (1605) (which was one of, if not, the first really important philosophical books to be written in English rather than Latin) about the *literary language* his scientific colleagues used. He had made a plea against scientific tracts being written in poetic language or Latin (a tongue associated with verse and poetry).<sup>52</sup> In 1637, Hobbes had argued in his *Art of Rhetorick*<sup>53</sup> metaphors are essential to animate a text, but in *Leviathan* (1651), he suggests they must not be included in scientific writing, since

*In all rigorous search of truth,.....metaphors are to be in this case utterly*

In 1660, the Royal Society was persuaded to adopt a definite programme to dissuade their members, many of whom were classical scholars, to relinquish *the language of Wits and Scholars* and to use a clearer more scientific style *modeled upon that of Mechanicks and Artisans*.<sup>55</sup> Bacon not only made a plea for a departure from archaic prose: he also championed a departure from anthropomorphism. It must be said he had referred to the Universal Analogy in his earlier works, but became a dedicated anti-analogist and consciously shunned any reference to the microcosm/macrocosm correspondence in his later books.

The language of poetry itself had also changed in the seventeenth century: John Donne was different in both style and language from Edmund Spenser or even William Shakespeare. Spenser who was recognized by his sixteenth century contemporaries as the successor to Geoffrey Chaucer, was the foremost English poet of the day, and indeed is considered by some critics as the foremost English poet of all time. He is hailed as *the Poet's Poet*; his verse had been described as "*halfway to music*". His archaic poetic language and rigid adherence to classical metre can be seen in this sonnet:

*Long languishing in double malady  
Of my hart's wound, and of my bodies griefe;  
There came to me a leach<sup>k</sup>, that would apply  
Fit medicines for my bodies best reliefe,  
Vayne man, quod I, that hast but little priefe  
In deep discovery of the minds disease;  
Is not the hart of all the body chiefe,  
And rules the members as it selfe doth please?  
Then, with some cordialls, seeke first to appease*

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<sup>k</sup> In this Spenserian sonnet, *leach*, of course refers to a doctor (from the Anglo-Saxon word *laece*, and one who relieves pain); *prieve* in line 5 means *proof*; the word *cordialls* (line 9) is taken to mean a heart stimulant from its Latin root (*cor, cordis*, heart). *Salve* means a cure or remedy.

*The inward languor of my wounded hart,  
 And then my body shall have shortly ease:  
 But such sweet cordialls passe Physitions art.  
 Then my lifes Leach! do all your skille reveale;  
 And, with one salve, both hart and body heale.<sup>58</sup>*

The language is the archaic flowery poetic language of the pre-Renaissance. In content, too, it is clear that Spenser still considers the heart rather than the brain to be the *chiefe* viscus, and clearly believes that his recent *hart's wound* has consequently and directly given rise to his own *mynd's disease*. In this early plea for a holistic medical approach (and Spenser was writing at the end of the sixteenth century), he shows more than a mild degree of scepticism towards a doctor not able even to treat a wounded heart.

Although Edmund Spenser's life (1522 - 1599) overlaps that of John Donne (1572 - 1631), the style and content of their poetry are totally different. In contrast John Donne and his followers are revolutionary. Their poetry is at a different pole from the pastoral lyrical verse of Spenser. An example of this follows in Donne's poem, *Metempsychosis*. Donne abandons classical metre. The ardent imagination and bewildering allusiveness and taste for metaphysics is apparent.

*Adam and Eve had mingled bloods and now  
 Like Chimiques equall fires, her temperate wombe  
 Had stew'd and form'd it: and part did become  
 A spungie liver that richly did allow  
 Like a free conduit on a high hills brow  
 Life keeping moisture into every part.  
 Part harden'd it selfe to a thicker hart  
 Whose busie furnaces lifes spirits doe impart:  
 Another part became the well of sense  
 The tender well-armed feeling brain from whence*

*Those snowy strings which do our bodies tie*

*Are ravel'd out.*<sup>57</sup>

Although Donne is very hesitant to abandon the pre-Renaissance concept of Nature, perhaps his most striking step has been to discard the archaic, poetic language so important to Spenser, and to a lesser extent Donne's contemporary Shakespeare; he willingly ransacks the newly springing branches of science for the most unpoetic vocabulary to give a surprisingly effective result. "*Spungie liver*", "*Busie furnaces*", "*free conduit*", "*moisture*" can hardly be considered poetic and yet they seem to give the poetry a new exhilarating effect. Donne can be compared to his contemporary, the painter, El Greco, (1541 - 1614) in that he maltreats language in the same way that Greco distorts the body in his paintings, but by doing this both achieve a much greater impact.

#### **I. 8. MAN IS NO MICROCOSM**

Ralph Knevet (1601 - 1671) wrote:

*Man is no microcosm, and they detract*

*From his dimensions who apply*

*This narrow term to his immensity.*

*Heaven, Earth and Hell in him are packed:*<sup>58</sup>

Although the opening line of his poem seems initially to refute the microcosm/geocosm/macrocasm correspondence, it quickly becomes apparent that Knevet remains archaic in his view of Nature and has in fact widened the correspondence to include hell as well as heaven and earth.

Knevet was an Anglican vicar living in East Anglia. In the verse quoted above he introduces the concept *Man is no microcosm* and then goes on by using irony, paradox and obliquity to show that in fact man is a microcosm. This type of poetic *conceit* is very characteristic of a style of poetry devised in the first part of the 17th Century and

to which the name *metaphysical* was applied.<sup>1</sup> John Donne, who was also an Anglican clergyman (and metaphysical poet) although fond of using the new scientific language in his verse still embraced the concept of the *little world made cunningly*. Knevet too clings on to the Old Philosophy in his poem, whether from true conviction or that archaic poeticism which characterizes poetry from prose. The names most often associated with the term, metaphysical poetry are Donne and Cowley, but other well-known metaphysical poets include George Herbert, Andrew Marvell, Henry Vaughan and Richard Crashaw.

Abraham Cowley and Henry Vaughan were both medically qualified, though they make few medical references.<sup>m</sup> There is, however, another contemporary physician who also published an albeit relatively undiscovered book of poetry in 1654 which is packed with medical allusions. John Collop, M.D. wrote poetry the style of which would certainly be described as metaphysical, and his ideas, unlike Vaughan and Cowley (and for that matter Donne) are radical, revolutionary and fired by the *New Philosophy*.

Collop's poems lay unknown and undiscovered until 1921 when a foreign professor, browsing through an old bookshop in London came upon an old copy of his works. Drinkwater praises him greatly hailing him as *an unknown poet of some considerable merit* and says that his work contains *some half dozen lyrics that seem to me to stand with the very best of seventeenth century poetry*.<sup>81</sup> Drinkwater's description of Collop as being "unknown" is not quite accurate: his name appears in the *Dictionary of National Biography*, though the entry is brief and states that although he signs himself M.D., there is no record of his education. Webster, describes him as *a London*

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<sup>1</sup> Although the term *metaphysical poetry* is usually attributed to Samuel Johnson (vide infra) it was in fact, first used by the poet, William Drummond of Hawthornden in 1630, when he used it somewhat pejoratively, complaining about contemporary poets trying to *abstract poetry to metaphysical ideas and scholastic quiddities*.<sup>80</sup>

<sup>m</sup> There are ten other medically qualified poets mentioned in the *Biographical Dictionary of Renaissance Poets*<sup>80</sup>, but I could find no medical references in their works, when indeed I could trace their poetry. The poets are: William Barclay (1570 - 1630); John Bullokar (fl. 1622); Thomas Campion (?1559 - 1634); Edmund Graille (fl. 1611); Matthew Gwinne (1586 - 1627); John Hall (1529 - 1566); Robert Mead (1616 - 1653); Thomas Moffett (1553 - 1604); Luke Shepherd (fl. 1548 - 54) and Thomas Twyne (1543 - 1613).

physician. Venn and Venn, however, in *Alumni Cantabrigienses* (1922) tell us that he certainly started his medical education at Pembroke College. Poynter (1956) suggests he almost certainly obtained his medical degree at one of the continental universities.<sup>820</sup> Also in 1956, Hilberry studied Collop for a doctoral thesis and has traced his medical practice to Hitchin, Hertfordshire around 1656; he considers that his dates should be 1625 - post 1676.<sup>n</sup> Most of his medical works are bitter satires. He is a medical revolutionary and attacks all the Galenic medical orthodoxy, humoral theory (see Capit. II) and phlebotomy (Capit. IX). His poem, *Man a Microcosm*, deals a satirical death blow to the Universal Analogy and all the concepts dependent upon it; it is worth quoting in full:

*Man, a Microcosm*

*Natures Compendium, th' worlds Epitome,*  
*Our flesh is earth, our blood is as a Sea.*  
*Have heav'n in Knowledge; Soul of Gods a ray,*  
*Which in the night of flesh breaks forth a day.*  
*What light without, that knowledge is within,* 5  
*Through th' eyes the windows of our Souls let in.*  
*To circle 'bout the world the blood's a Sun,*  
*The Stars the senses, which their courses run.*  
*Motions and perturbations of the minde,*  
*Resemble tempests, thunder, lightning, wind,* 10  
*Which in our aery Region do arise,*  
*To cloud the minde, and so obscure the Skies:*  
*These on the blood Commotions once begun,*  
*We lose th' effect of light by th' clouded sun.*  
*Tumours like Meteors in our bodies rise,* 15  
*The exhalations of impurities:*  
*And in a Collique or Hysterique fit,*

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<sup>n</sup> Unlike the D.N.B. which gives them as 1625 - post 1660. Hilberry has proven his marriage and residence in London at least in 1676.

*We feel pent wind a Earthquake make in it.*

*Congeaed slime like Thunder-bolts, we finde*

*By heat of reins in clouds of flesh confin'd.*

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*Our minde the day is, and our flesh the night,*

*Death is but darknesse, and our life the light.<sup>63</sup>*

Collop introduces a note of sarcasm in the title itself, *Man, a Microcosm*: and is even more directly scathing of the microcosm theory in his prose theses *Medici Catholicon* published the same year, 1656.<sup>64</sup> In this first line, *th' world's Epitome*, Collop is probably making a direct reference to Sir Thomas Browne's *Religio Medici* II, 10, 11. Collop devoted a whole poem to lampoon Browne, who was a firm believer in the Universal Analogy. Collop's opinion of Browne is clearly not complimentary: the poem on him begins, *Religio Medici though the World Atheism call, The world shows none, and the Physitian all*. This may mean that although the religion of a doctor (*Religio Medici*) is generally taken to be atheism, the world shows no religion, and the physician (Browne) all! The mocking reference to *our blood is as a sea* in line 2 is an oblique allusion to the Empedoclean ebbing and flowing haemodynamic theory (which is more fully described in Capit. IV), and he follows this through in line 7 with: *To circle 'bout the world the blood's a sun*. This line refers us to William Harvey's recent discovery of the circulation. In Harvey's dedication of *de Motu Cordis* to Charles I, he calls the heart, *the sun of the microcosm*. In line 6, an interesting allusion is made to the old idea that God's light enters the soul through the eyes. In lines 9 - 12 where the *perturbations of the mind* are caused by colic, Collop may have been influenced by Paracelsus who according to van Helmont said *For so he will have us to contain winds and their varieties, our wringings of the bowels also, to answeare unto the tempests of the Air*. The reference in line 15 to *Tumours* rising from an excess of *impurities* is certainly interesting (Galen considered that tumours were an accumulation of yellow bile). In line 18, we are reminded of Pliny's assertion: *I certainly conceive the winds to be the cause of earthquakes*. Pliny's concept that *Vapour, which has arisen from the earth ... may produce thunder when it is pent up in a cloud* is satirized in lines 19 - 20.



The word *reins* in line 20 is meant to imply kidneys, but is surely also a pun on rains.

The aim of this thesis is to show that progress in medical knowledge is reflected in contemporary English poetry; and in the concept of man's place in the Universe, this change was painfully slow. John Donne's poetry and that of the other metaphysical poets may have been dramatically revolutionary in style, but nonetheless he and even Henry Vaughan and Abraham Cowley clung on to the old ideas. They let us know they are aware that changes are afoot and that we are in an era of scepticism; that *New Philosophy calls all in doubt*, but poets are, for the majority, extremely noncommittal.

Although Vaughan and Cowley were doctors, they were not writing for other doctors, but for the laity; we can assume therefore that their audience would understand their poetry. John Collop was another physician who wrote most of his verses for the public. With respect to contemporary medicine, he is clearly a revolutionary, but his dissident verses are undoubtedly in the minority. He feels passionately about the contemporary progress in medicine and science and is using his poetry as a vehicle for health education. He has realised that the dawn of the Age of Reason has begun to glimmer and is trying to communicate his excitement to his poetic audience.

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## CHAPTER II

### ON THE HUMOURS

*How wisely th' bloody masse is understood*

*Two Cholers, black and yellow, phlegm and blood.<sup>1</sup>*

John COLLOP (1656)

#### II. 1. THE ELEMENTS THAT DO MAN'S HOUSE COMPOSE

Empedocles suggested a self-conflicting universe created from four elements: earth, air, fire and water. Plato (BC 429-347) the student of Socrates and teacher of Aristotle (BC 384 - 322) wrote in *Timaeus*, that diseases are caused by changes in the four basic elements.<sup>2</sup> Empedocles, like Heraclitus had believed that the two forces of *Love* and *Strife* interact to both unite and also separate the elements, Love making them intermingle and Strife causing them to disperse. Edmund Spenser (1552 - 1599) in his *Hymn of Love* (1596), remarks that the elements were in constant Empedoclean chaos with each other and *in no wise harmonious*.<sup>13</sup> Milton in *Paradise Lost* described the Chaos as it appeared to Satan at the Gates of Hell.

*For Hot, Cold, Moist and Dry, four champions fierce*

*Strive here for mastery, and to battle bring*

*Their embryon atoms.<sup>4</sup>*

Milton, here talks not of the elements themselves, but of their *qualities*. Each element had two qualities; fire was hot and dry; water was cold and moist, air was hot and moist and earth was cold and dry. The three poets above tell of these elements being in this conflict (first suggested by Empedocles) and Milton says they *strive for mastery*. They were thought each to have *their almost ceremonial places in the great World order*.<sup>5</sup> Earth was thought to be heaviest and lowest; it was after all at the centre of the geocentric universe: exterior to earth and next in the rank was water; air came superior to this, and noblest of all was fire.

Chapman and Sandys refer to the hierarchy and order of the elements, and the constant flux of interchange between them.<sup>6</sup> Milton also refers to this in *Paradise Lost*:

.....of Elements

*The grosser feeds the purer, Earth the Sea,  
Earth and the Sea feed Air, the Air those Fires  
Ethereal, and as lowest first the Moon;  
Whence in her visages round those spots, unpurg'd  
Vapours not yet into her substance turn'd.*<sup>7</sup>

In this passage, Milton's reference to the Moon alludes to the Elizabethan belief that the four elements only existed as such in the sublunary region because they were never perfectly mixed, whereas above it, in absolute harmony was the quintessence. Thus below the moon all was corruptible and subject to decay (see also section I.2)

In this section, Milton, Spenser and Chapman all tell how God created the Universe including Man (*every living wight*) from four basic elements, which are in a constant state of flux. The imperfect balance of these elements was thought to be the reason why everything sublunary was susceptible to decay. To the educated Elizabethan mind, knowledge of these four elements was quite fundamental. When Cleopatra, for example, said she was all air and fire, *the educated part of the audience at least would understand without the slightest effort of memory*<sup>8</sup> the significance of this.

## II.2. FOURE HUMORS RAIGNE WITHIN OUR BODIES WHOLLY\*

Since all things on God's earth were made of the four elements, so must be plants, animals and man himself. Christopher Marlowe (1564 - 1593) tells us of:

*Nature that fram'd us of four elements*<sup>9</sup>

The previous chapter showed how the Pythagoreans found in man, the *microcosm*, a full set of similarities to the Universe or *macrocosm*: this microcosm/macrocosm analogy was part of the doctrine of correspondences. The humours are correspondences with the elements and

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\* Harington's School of Salerno (vide infra).

that correspondence is shown viz:

ELEMENT	QUALITIES	HUMOUR	TEMPERAMENT
Earth	Cold & Dry	Black Bile	Melancholic
Water	Cold & Wet	Phlegm	Phlegmatic
Air	Hot & Wet	Blood	Sanguine
Fire	Dry & Hot	Yellow Bile	Choleric

The elements were ingested as food and then converted by the liver *into four liquid substances, the humours, which are to the human body what the elements are to the common matter of the earth.*<sup>10</sup> The primary source of humours then was from food.

Humours as the bodily counterparts of elements, first emerge in medical thought in the *Hippocratic Corpus*<sup>b</sup> of circa 380 BC,<sup>11</sup> phlegm and bile taking on a role in the causation of disease, phlegm being associated with water, and bile with fire. The first mention of *four* humours rather than four elements is very unclear.<sup>13</sup> In the *Hippocratic Corpus*, we are told of blood, phlegm, bile and water: black bile emerged in the Corpus in *On the Nature of Man*. In Galen's clinical writings, however, he talks exclusively of *qualities* rather than elements, or humours.

Sir John Harington sums up the above relationships nicely in his English poetical translation of the famous *Regimen Sanitatis Salernitatum* (1607), viz:

*Four humors raigne within our bodies wholly,*

*And these compared to foure Elements,<sup>14</sup>*

Harington here gives a full comparison of the humours and their primary qualities: *blood*

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<sup>b</sup> The Hippocratic Corpus is a body of medical treatises written in Ionic (a dialect of Greek) between 410 and 360 BC and associated with the so-called Father of Medicine, Hippocrates of Cos (450 - 370 BC). Contemporaries point out he was a great teacher of medicine and physician in Athens, but there is no conclusive proof of his authorship of the Corpus, which is in fact thought to have been written by more than one author.<sup>12</sup>



which is hot, moist and corresponds to air and is produced by the stomach; *black bile* which is cold and dry, corresponds to earth and is manufactured by the brain, *yellow bile* which is hot and dry, corresponds to fire and is made by the heart, and *phlegm* which is aligned with water in being cold and wet, is produced by the liver. Black bile may seem to be the anomaly, since most laymen are aware of what blood, phlegm and even (yellow) bile look like; evidently black bile *bubbled and fizzed when it hit the ground*<sup>16</sup>

John Donne preached (during Lent 1623) that *every man is a sponge, and but a sponge filled with tears*,<sup>16</sup> and this indeed may have been his audience's perception of their bodies. In 1615 the King's physician, Hezekiah Crooke wrote in his *Microcosmographia: A Description of the Body of Man*, that *man is the moystest and most sanguine of all Creatures*.<sup>17</sup> This concept of a moist sponginess has led modern commentators to suggest varying concepts of contemporary self perceptions:<sup>c</sup> these include a system of humour irrigated canals<sup>18</sup> (Rather 1974) and *a semipermeable, irrigated container in which humours moved sluggishly*.<sup>19</sup> (Paster 1993)

### II.3. THE TEMPERAMENTS OR COMPLEXIONS

The *temperaments* or *complexions* were thought to depend on the variant proportions of the primary qualities and therefore of the four humours and will give rise to different physical and mental attributes and dispositions. Hence a *sanguine* man was hot and moist (like air) having an excess or preponderance of blood, whilst a *melancholic* man was cold and dry (like earth) because of his excess of black bile. Similarly, the *phlegmatic* man was cold and moist (like water) and the *choleric* man hot and dry (like fire) from their respective over endowments of phlegm and yellow bile (cholera). In the 14th Century, Chaucer alludes to the complexions: in his *Prologue* to the *Canterbury Tales* he refers to the *Sangwyn* complexion of the Franklyn, and refers to the Reve as *a sclendre colerik man*.<sup>20</sup>

In Harington's *Regimen Sanitatis Salernitatum* (1607), he goes on to give another delightful

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<sup>c</sup> Paster (1993) provides a review of humoral theory in the Introduction to her book, *The Body Embarrassed*.<sup>19</sup>

description of the *Complexions*, being careful to point out that although, per se, the temperaments or complexions are not the root cause of vice or *virtue*, they can certainly predispose to it.

*Complexions cannot vertue breed or vice,*

*Yet may they unto both give inclination.*<sup>14</sup>

He then goes on to give us an example of each humour, at first being in slight preponderance, and then being in superabundance. First of all he illustrates this with *Blood*. A slight preponderance of humoral blood in the body will evidently produce a sanguine complexion or temperament which will predispose to becoming a carefree playboy, with a jolly personality and a tendency to become overweight. There was, however, a distinction between a sanguine temperament which was caused by only a slight imbalance of the proportions of the four humours in favour of humoral blood, and what was considered a definite excess. In these cases, a *dys-temper* was said to exist. Harington tells us the effects of such a surfeit of humoral blood:

*If Sanguine humour doe too much abound,*

*These signes will be thereof appearing cheefe,*

*The face will swell, the cheekes grow red and round,*

*With staring eyes, the pulse beate soft and breefe,*

*The veines exceed, the belly will be bound,<sup>d</sup>*

*The temples and the fore-head full of grieve<sup>14</sup>*

There is a very rare disease called *polycythaemia* in which the bone marrow produces too many red blood cells. In this, the face is a ruddy brick-red complexion with prominent facial blood vessels and the rims of the eyes and conjunctiva are suffused with blood. Headaches are one of the first symptoms and certainly the description above would fit the clinical picture nicely. Polycythaemia is certainly the result of too much blood but it is not at all common. A much more prevalent disease (and even more so in pre-antibiotic days with poor social conditions) would be rheumatic heart disease leading to a damaged heart valve (mitral stenosis) which

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<sup>d</sup> constipated

typically gives bright red cheeks and a low volume pulse (*the pulse beate soft and breefe*). Another more common malady than polycythaemia would be *cor pulmonale* which is heart disease caused by chronic lung disease. In this the face often starts quite red when the patient is known as a "pink puffer", but as the disease progresses it develops a darker hue, and the sufferer becomes a "blue bloater". *Cor pulmonale* too gives throbbing headaches and it is often difficult to hear the bounding heart because of the overinflated lungs.

The School of Salerno also tells us of the effects of a slight preponderance of Yellow Bile, Phlegm and Black Bile on the temperament: too much yellow bile or *choler* would make a person choleric or bad tempered; the phlegmatic temperament is unattractive for different reasons, being of *dead spirits* and *dull senses*. Evidently persons of phlegmatic complexion are idle and unlikely to put themselves out for you. The melancholic temperament is said to be different to the others, being pensive, solitary, suspicious and mistrustful.

The appearance of certain bodily fluids in disease which disappear spontaneously when the patient recovers, suggested that illness is a result of the imbalance of fluids. Diarrhoea is an obvious example. Blood too, was thought to be a symptom and also a cause of illness (e.g. haemorrhoids, nosebleeds, menstruation and expectoration of blood). This appearance of abnormal body fluids strengthened the belief held by Mediaeval physicians that disease was caused by an imbalance of the humours.

*In health there is a just proportion of qualities or humours mingled together in the human body; in sickness there is an excess of one or more qualities, according as the distemper is simple or compound.* <sup>21</sup>

This belief that it was the dysharmony of the humours which caused disease led to attempts to redress that imbalance (which was usually thought to be an excess) by changing the fluid balance of the body. The usual interventions to bring this about were phlebotomy, purgatives, emetics and enemas (which are described at VI.9) as each of these methods was designed to rid the body of the excess humour, restore the *dys-temper* and re-establish that harmony of humours essential for health. Harington says

*Against these severall humors overflowing*

*As severall kinds of Physick may be good,*

*As diet, drinke, hot baths, whence sweat is growing,*

*With purging, vomiting and letting bloud.<sup>14</sup>*

There can be little better evidence to support the premise that contemporary poetry gives an insight into prevalent medical ideas of the day than Harington's verses cited above, although it must be conceded, he was translating a medical text. Wittily and succinctly, he tells us first of the humours and the effect of a slight preponderance to produce the four temperaments. He then goes on to paint graphic word pictures of the results of pathological excesses. Finally he tells us of the *severall kinds of Physick* available to treat *these severall humors overflowing*.

#### II.4. THE CONCEPT OF DUE PROPORTION

The four simple temperaments referred to above are situations in which one humour (or one pair of qualities) predominate. The vast majority of the population then, would fit into one of these categories - either sanguine, choleric, phlegmatic or melancholic - owing to the fact that the four humours are hardly ever perfectly balanced (even in health) and one of them is usually predominant. In addition to these four temperaments, however, in which by definition there is dysharmony of the humours, there remains a fifth: *finally, in one temperament all the qualities were duly proportioned, with none of them dominant neither singly nor in combination.*<sup>22</sup> This was the concept of *due proportion* and it was used to describe an ideal person with an ideally proportioned mixture of the four humours. Perhaps an analogy can be drawn between due proportion and the alchemical concept\* that all metals were made from the same four basic elements combined in different proportions. When those proportions were "ideal", then gold - the perfect metal would result.

Shakespeare alludes to due proportion when Mark Anthony describes *the noblest Roman of them all*:

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\* The strong reliance of alchemy on humoral theory is fully explored by Hopkins (1957), who underlines the importance of the four elements and their interchangeability and also several additional "psychic influences" that mark alchemy's Greek inheritance: the hylozoistic concept of the universe; the idea that nature is alive and sentient; the harmonious relationship between macrocosm and microcosm.<sup>28</sup>

*His life was gentle; and the elements  
So mix'd in him that Nature might stand up  
And say to all the world, "This was a man!"*<sup>24</sup>

The subject of John Donne's *Anniversaries* was similar:

*Shee whose complexion was so even made  
That which of her Ingredients should invade  
The other three, no fear of art could guess:  
So far were all removed from more or less.*<sup>25</sup>

This is in contrast to the humoral imbalance used when the Dauphin in *King Henry V* describes his mettlesome horse:

*It is a beast  
for Perseus: hee is pure Ayre and Fire;<sup>f</sup> and the dull  
elements of Earth and Water never appeare in him, but  
only in patient stillness when his Rider mounts him.*<sup>26</sup>

## II. 5. HUMOURS AND ASTROLOGY

Humours, of course, could not escape the overwhelming influence of the stars, and Antiochus of Ascalon (fl. AD 180) extended the Galenic theory to astrology, ascribing one humour to each of the cardinal points of heaven. Phlegm was associated with Taurus, Virgo and Capricorn; and black bile with Cancer, Scorpio and Pisces; cholera with Aries, Leo and Sagittarius; and blood was aligned with Gemini, Libra and Aquarius. In the *Squires Tale*, Chaucer says *In Aries, the colerik hote sign*. The manner in which the astrological dominion over the humours was interpreted by the mediaeval physician is very complex. Galen put great importance on the influence of the moon: evidently,

*by observing the position of Luna he may determine precisely from what humour or combination of humours the malady proceeds.*<sup>21</sup>

The overwhelming importance of astrology to the pre-Renaissance man is worthy of

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<sup>f</sup> It was mentioned above (I.1) that Cleopatra described herself as air and fire. The properties of air and fire are to go upward towards heaven in a straight line, as opposed to earth and water which go down.

emphasis. There was a different preponderance of humours in different seasons and also at different ages; blood was associated with spring and childhood; bile with summer and youth; black bile was aligned with autumn and adulthood, and phlegm with winter and naturally enough old age.<sup>27</sup>

## II. 6. CHAUCER AND THE HUMOURS

Chaucer underlines the importance of Galenic humoral theory in the *Prologue* to the *Canterbury Tales*. He tells us that his *Doctour of Physick* was such a *verrey parfit practisoure* because,

*He knew the cause of everiche maladye  
Were it of hoot or cold, or moist or drye  
And where engendred, and of what humour.*<sup>28</sup>

Although it is almost certainly a literary means of emphasizing the arrogance and pomp of his *Doctour*, it is noteworthy that he knew the cause of *everiche* (every) malady, not just one or two, or even the majority, but every one - because the humoral theory could be made to provide a causal explanation of any disease.

In the *Nonne Preestes Tale*, Chaucer gives us more references to the humours.<sup>29</sup>

*Chauntecleer*, a cockerel, has just told his favourite hen, *Pertelote*, that he is suffering from bad dreams. Her interpretation (which in the event can be seen as a misinterpretation!) and her suggestions give us quite a few medical references. The hen tells him that his bad dreams are engendered by being too replete or that they are from vapours in his belly caused by an excess of humours. She continues:

*Certes this dreem, which ye han met to-night,* 4116  
*Cometh of the greet superfluitee*  
*Of youre rede colera, pardee,*<sup>9</sup>

She further affirms that it is certain the dream which he had (4116) came from an excess (*superfluitee*) of *rede colera* (red cholera) which causes him to dream of blood-stained arrows

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<sup>9</sup> of course

fires flaming and biting creatures, great and small.

*Right as the humour of malencolye*

4123

*Causeth ful many a man, in sleep, to crye,*

*For feere of blake beres, or boles blake,*

*Or elles, blake develes wole hem take.*

*Pertelote* now has gone on to tell *Chauntecleer* what sort of dreams he would get if he had a distemper from an excess of melancholy. Crying out for fear of black bears (*blake beres*) and bulls (*boles*) or else black devils (*develes*). She defers from going on to tell about other distemperate dreams, but continues, however,

*For Goddes love, as tak som laxatyf;*

4131

*I counseille yow the beste, I wol nat lye,*

*That bothe of colere and of malencolye*

*Ye purge yow. . . .*

She beseeches him for the love of God to take some *laxatyf* to purge himself of the excess humour.

*. . . Ye been ful colerik of compleccioun.*

4145

*Ware the sonne in his ascensioun*

*Ne finde yow nat repleet of humours hote;*

*And if it do, I dar wel leye a grote,*

*That ye shal have a fevere terciane,*

*Or an agu, that may be youre bane.*<sup>30</sup>

These lines are very interesting and bring in a number of features of 14th Century Medicine: the hen tells him his face is choleric and this was thought to be a sign of distemper. (*The Colour shewes from whence it lightly came ... The Chollerick more red*)<sup>31</sup> from having an overabundance of choler. In the next line (4146), the danger is pointed out of the *Sonne in his ascensioun* which is astrologically very threatening to anyone with abundance of hot humours. Coghill's translation explains this peril eloquently:

*Be careful lest the sun in his ascension*

4146

*Should catch you full of humours hot and many.*

*And if he does, my dear, I'll bet a penny*

*It means a bout of fever or a breath*

*Of tertian ague. You may catch your death.<sup>32</sup>*

Her cure is also fascinating. She feeds him worms as a digestive for a couple of days and then prescribes laxative herbs gathered from the farm-yard.

*A day or two ye shul have digestyves*

4151

*Of wormes, er ye take yer laxatyves*

*Of lauriol (caper spurge), centaure (centaury) and fumetere (fumitory),*

*Or elles of ellebore (hellebore) that groweth there,*

*Of catapuce (laurel), or of gaytres beryis (sloes),*

*Of herbe yve (ground-ivy), growing in our yerd, that mery is;*

*Pekke hem up right as they growe, and ete hem in.*

*Pertelotes'* misinterpretation of *Chauntecleer's* dream of a fox is perhaps a definite ploy of Chaucer and is perhaps characteristically designed to make the reader feel that her treatment in the use of a *laxatyf* is not the treatment of choice. In fact the cock would be better served if he kept alert and vigilant of the foxes wiliness. In the *Nonne Preeste's Tale*, Chaucer gives us some information about contemporary medical beliefs. He tells us that an excess of red cholera causes bad dreams. Over two hundred years later, the *Salernian Regimen* was still positing that an excess of choler caused *of fire-worke oft you dreme*. *Chauntecleer* might not have dreamed of fireworks, but his dreams were certainly colourful and violent.

Getz considers that in this poem Chaucer reveals his opposition to interventionist medicine and illustrates his medical humanism.<sup>33</sup> *Chauntecleer* lived in the farmyard of a poor and temperate widow, whose poverty enforced on her a moderate lifestyle (a regimen of health): we hear of this widow that

*Repleccioun ne made hir nevire sik*

*Attempree dlete was al her physik*



*And exercise, and hertes sufficaunce.<sup>h</sup>*

Getz believes that Chaucer is contrasting the virtuous, modest widow with the vain rooster whose life was an allegory of excesses - particularly sexual: *seven hennes.... Which were his sustres<sup>i</sup> and his paramours*. This humanist view of the maintenance of good health by diet was essentially Galenic, and encompassed diet in its true classical sense *diaeta* which does not just refer to food, but to one's entire regimen or mode of life and includes temperance of all Galen's "non-naturals" - food, drink, sleep, air, constipation and emotion.

Robert Henryson, (1430 - 1506) a Scottish poet who took a great impulse from his predecessor Chaucer, also points out what the effect of altering the balance of humours can be. Chaucer in 1385 had written the story of *Troilus and Criseyde*, and in homage to his mentor, Henryson wrote the *Testament of Cresseid*. The poem is a narrative and "complaint" of 86 stanzas, in which we hear how a curse is put upon *Cresseid* as a result of her *leving unclene<sup>j</sup> and lecherous*.<sup>34</sup>

*I change . . . . thy moisture and thy heit<sup>k</sup> in cold and dry.<sup>l</sup>*

This change of her humoral blood into black bile has a dreadful effect causing her to have bloodshot eyes, laryngitis, a genital abnormality and a lumpy face.

*Thy crystal ene<sup>m</sup> minglit wi' blude, I mak,*

*Thy voice sae cleir<sup>n</sup>, unplesand hoir<sup>o</sup> and hace,<sup>p</sup>*

---

<sup>h</sup> *Repletion never left her in disquiet  
And all her physic was a temperate diet  
Hard work for exercise and heart's content.*

<sup>i</sup> *sisters*

<sup>j</sup> *unclean living.*

<sup>k</sup> *moisture and heat* refers to her blood.

<sup>l</sup> *cold and dry* is black bile.

<sup>m</sup> *eyes*

<sup>n</sup> *clear*

<sup>o</sup> *feeble*

<sup>p</sup> *rasping*

*Thy lusty lyre<sup>a</sup> oursprede wi' spottis black*

*And lumpis haw' appeirand in thy face.*

*Qhuair<sup>r</sup> thow commis ilk man sall fle the place*

This has been interpreted by a famous Scottish physician of the last century, Sir James Young Simpson, as lepromatous leprosy.<sup>35</sup>

In this section the references from Chaucer, and Henryson certainly support the contention that contemporary poetry reflects current beliefs and trends in medicine. Chaucer's introduction of the *Doctour* not only gives a vivid picture of a pompous, self-opiniated, posturing physician, which was perhaps the general impression of doctors in the 14th century, but more importantly underlines the belief that imbalance of the humours were thought to cause *everiche maladye*. In the *Nonne Preeste's Tale*, we are told graphically of the results of first an excess of choler, and then of black bile. The effect of these two humoral imbalances is similar to that expressed in the *Salernian Regimen*. In Chaucer's poem, the contemporary practice of removing excess humours by a purge is alluded to, albeit in a lighthearted amusing manner.

Henryson then further emphasizes the contemporary perception that a change in the humoral balance of the body was the principal cause of disease, when the curse on *Cresseid* to change her *moisture and heit* to *cald and dry* causes her to develop all the features of lepromatous leprosy.

## II. 7. POETIC REFERENCES TO HUMORAL THEORY IN THE SEVENTEENTH CENTURY

Humoral theory certainly survived into the poetry of the 17th Century. Shakespeare refers to humoralism in *Romeo and Juliet* (1592): when *Friar Lawrence* is telling *Juliet* about the phial of *distilled liquor* which shall induce a state of suspended animation, he says,

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<sup>a</sup> *vulva*

<sup>r</sup> *white*

<sup>s</sup> *where*

*.... through all thy veins shall run*

*A cold and drowsy humour, which shall seize*

*Each vital spirit;*<sup>36</sup>

In the *Merchant of Venice* (1600), *Shylock* excuses his cruelty by claiming,

*But say it is my humour: Is it answer'd?*<sup>37</sup>

And in *Othello* (1604), when *Desdemona* pitifully asks *Iago* why her husband has just abused her by calling her a whore, *Iago* replies:

*'Tis but his humour*<sup>38</sup>

Examples were quoted at the beginning of this chapter of the *Elements* by Milton, Spenser, and Marlowe. These examples all refer to the Creation of the macrocosm, but allusion is also made to the microcosm by some of the metaphysical poets. William Hammond (fl.1655 - 1685) alludes to humoral theory in his *On the Death of my Dear Brother* (1655)

*The Elements, that do man's house compose*

*Are all his chiefest foes;*

*Fire, air, earth, water all are at debate*

*Which shall predominate*<sup>39</sup>

it will be seen that Hammond here refers to *Elements* rather than humours, but alludes to the fact that they are certainly not in harmony, but on the contrary, *at debate*.

George Herbert (1593 - 1633) wonders if his dullness is due to a preponderance of black bile (melancholia) which is cold and dry and corresponds to earth.

*Why do I languish thus, drooping and dull*

*As if I were all earth?*<sup>40</sup>

Herbert, like Hammond refers to *Elements* rather than humours. This is presumably a poetical device, rather than a contemporary belief that elements rather than humours were the bodily components. The use of *earth* would be immediately understood by the educated 17th century reader and its correspondence to black bile and hence melancholy readily understood (as on the Table above in Section II.2). Herbert later (1633) refers to the importance of humoral harmony in *Temperance and Society: If all our corporall life depend upon the harmonie of humours and elements*.<sup>41</sup>

Henry Vaughan the Welsh physician/poet (1622 - 1695) considers both Man and his element, Earth to be mirthless.

*How do they cast off grosness? only Earth  
And man ..... in loads delight,  
Water's refin'd to Motion, Aire to Light,  
Fire to all three, but man hath no such mirth.*<sup>42</sup>

John Donne in 1620 in *The First Anniversary* alludes to an imbalance of humours causing disease, but he says:

*That this worlds generall sicknesse doth not lie  
In any humour or one certaine part.*<sup>43</sup>

In fact in this particular reference, Donne is saying that disease (albeit metaphorical) is not always caused by a humoral disproportion. This does mark a change from the earlier concept. Donne is saying that disease can exist which is not caused by their imbalance, whereas Chaucer had averred that *everiche maladie* was caused by *hot or colde, or moiste or drye*. The 17th century poetical references quoted in this section all clearly show that the Galenic concept of the bodily humours was still well known, but certainly John Donne's verse is a challenge to its primacy. The earliest quotation in the section is actually from the end of the 16th century (*Romeo and Juliet* 1592). Shakespeare's allusion to a *cold and drowsy humour* about to flow through *Romeo's* veins is very reminiscent of the curse put on *Cresseid* in the previous section when her hot moist blood is turned to cold and dry. This is an example of the traditional view seized upon by the Bard for full dramatic effect.

Shakespeare's references to the humours a few years later, however, (1600 and 1604) allude less to the elemental Galenic fluids than to the *Comedy of Humours* (vide infra)

The metaphysical poets appear to refer to humoral theory by allusion to the elements rather than humours as such, and this could well represent the use of archaic ideas for enhanced poetic effect. In the example above, when Vaughan gives us an example of Man's *grosness*, he reminds us of the Biblical asinine *Issachar*, who is so dull he enjoys carrying heavy loads, and then compares this lack of mirth to elemental *Earth*. Marvell alludes to the

dysharmonious humours (*quarelling Elements*) alongside correspondences of *Tears* to the *Sea*, and *Sighs* to the *Winds*. John Donne goes further than using allusions to the humours for poetic effect: he states quite definitely that at least one disease *doth not lie in any humour*. Clearly Donne is moving towards a *New Philosophy* which sees disease as an external cause invading the body rather than an internal cause (a humoral imbalance). It can be seen from the verses above that contemporary poetry is reflecting a trend in 17th century medicine. Although all the poets still understand the theory of the Galenic humours and will readily use it for greater poetic effect, the importance and unshaken belief previously placed on this unproven dogma (in the time of Chaucer) has now been called into question.

## II. 8. PARACELSIAN AND HELMONTIAN CHALLENGE

Paracelsus (1493-1591) tried to combine alchemy and medicine and to use alchemy for finding new mineral medicines which were more powerful than the traditional Galenic herbal remedies. He introduced some new mineral drugs and was known as an *iatrochemist* or *chymical physician*. In place of the four humours, Paracelsus postulated three *principles*, salt, mercury and sulphur, and each of these had a symbolic significance: salt represented the material part of man; sulphur, the spiritual part; and mercury, the soul or *psychic substance*. All Paracelsians insisted that the study of medicine and nature should be based on fresh observations and experiments rather than the outdated writings of an Aristotle or a Galen. Paracelsus rejected the theory of humours, which was central to most existing theories of the causation of disease. To assume that diseases are separate entities which enter from the outside was incomprehensible, but this was just what Paracelsus believed. The refutation of humoral imbalance and the idea that diseases were due to external causes and lodged in particular organs was revolutionary. According to Pagel,<sup>44</sup>

*he was actually the first to teach that there are different diseases which can be classified, and that each disease is a peculiar reality.*

Another important Paracelsian departure from Galenic humoral theory was refutation of *contraria contrariis* (that "contraries cure") that is that one should cure a distemper resulting from too much "hot" humour by prescribing a medicine with "cold" qualities. Germanic folk

traditions averred a sort of homeopathic philosophy of *similia similibus*, that "like cures like", and held that the poison which caused an illness, would - in correct dosage - cure it. Paracelsus accepted this principle and it became *one of the most distinctive hall marks of his followers*.<sup>45</sup>

The Paracelsians were completely opposed to orthodox Galenic medicine and with it the theory of humours, and they were not willing to make any compromise. Paracelsianism and Galenism were totally incompatible. Debus, who has meticulously investigated the subject says, however, that despite their progress on the Continent of Europe, they made no headway in England *before the Puritan Revolution*.<sup>46</sup> Charles Webster<sup>47</sup> and Rattansi<sup>48</sup> agree with this view; Webster(1975) says that Paracelsian Medicine became a coherent medical force and *changed dramatically after 1640, and by 1650 .... was judged to have proved its superiority*., and again in 1978 makes further suggestions about the more widespread acceptance of Paracelsianism in England.<sup>49</sup> My opinion here is that he is being a little premature, or that he is referring more specifically to lay practitioners rather than orthodoxy. Certainly the Royal College of Physicians did not acknowledge any supremacy of Paracelsus' views; indeed in 1647 under their revised statutes of that year, the College still required knowledge of Galen's texts and tenets for admission to its membership. In 1655, Dr Lazar Riverius published a book, *Institutiones Medicae* in which he refers to primary and secondary humours and points out that these Galenic principles on which medicine is taught are "*certis, firmis, & indubitatis principiis*".<sup>50</sup> Lazar Riverius was acknowledged as having "*acquired a great reputation as a practitioner and a teacher*"<sup>51</sup> who had been appointed Professor of *Practical Medicine* in 1622. Riverius clung firmly to these Galenic principles, and his books were extremely popular not only into the 17th Century, which had a strongly conservative bent, but long after his death. A revised edition, *Riverius Reformatus or the Modern Riverius* enjoyed a vigorous popularity well into the 18th Century.

Heated controversy raged in the mid 17th Century and in 1648, Franciscus van Helmont published his father's book which was a sweeping indictment of Galenic Medicine, and which Webster considers (perhaps, somewhat as an overstatement) was *the final spur* to the

adoption of Paracelsian ideas within the English medical community. Jean Baptiste van Helmont (1580-1644) was a Belgian chemist who was a committed Paracelsian. King emphasizes the influence of Paracelsus on van Helmont, and indicates the general neoplatonic background of the two rebellious anti-Galenists who explicitly condemned the doctrine of the traditional humours.<sup>51</sup> Helmont denied that material bodies were composed of various proportions of earth, air, fire and water, but considered that water was the chief, if not the only, constituent of matter.<sup>t</sup>

During the 16th and 17th centuries then, the primacy of Galenic medicine was severely challenged. Both Paracelsus and van Helmont had refuted Galen's dogma and offered alternative theories. Paracelsus, in particular, was very well known in England and Webster states that by 1650 Paracelsianism had superseded Galenism. Van Helmont never enjoyed quite so much popularity as Paracelsus, but Helmontian ideas were evidently well known in Britain. The popularity of Lazar Riverius' books well into the 18th century, and the importance placed on Galen's theories by the Royal College of Physicians, however, show that although Galenic concepts were being called into question they were certainly far from dead. Tradition dies hard, after all.

## II. 9. POETS' REFERENCES TO ANTIGALENIST THEORY

In 1611, John Donne wrote a satirical fantasy in prose entitled *Ignatius, his Conclave*. It was a vehemently anti-Jesuit tract, in which Paracelsus is summoned together with Machiavelli and Copernicus by the Judge of Hell to answer as the *innovators* who had upset the world. By *innovators*, Donne meant *all which had invented any new thing, even in the smallest matters*.<sup>55</sup> He refers to Paracelsus (albeit somewhat grudgingly) saying that Galen's humours (he actually says *Elements*) do not provide all the answers: he also appears to be unconvinced by the important Galenic *specificity* principle, and of allopathic cures (i.e. cold

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<sup>t</sup> He considered that he had proved this by growing a tree in a pot, and adding only water to it! He did this by first weighing the dry soil and the young plant. He then grew it for five years and weighed all the water he gave it, as well as the leaves which dropped. At the end of his experiment, he weighed the tree and dried soil again and claimed that the whole increase in weight of the mature tree was a direct and sole result of the water he had added. With the addition of water only, the tree increased in weight by some 164 pounds, whereas the soil decreased by only a few ounces.<sup>49</sup> (vide infra II. 11).

being used to cure an excess of heat or as he puts it, *antipathy and sympathy*). He also says that the world has accepted the *principles* of Paracelsus:

*Men perceiving that all effects in Physick could not be derived from these beggarly and impotent properties of the Elements and that therefore they were driven to that miserable refuge of specifique form, and of antipathy and sympathy, we see the World hath turned upon new principles which are attributed to Paracelsus, but (indeed) too much to his honour.*<sup>53</sup>

There is no doubt then that Donne was aware of general Paracelsian philosophy. In Allen's treatise on *John Donne's Knowledge of Renaissance Medicine*, he argues that when Donne referred to *my physic books*, they were works by Paracelsus and Hippocrates.<sup>54</sup> Paracelsus certainly bases much of his philosophy on the correspondences between microcosm and macrocosm. Allen points out that Paracelsus compares *the pest to an earthquake, apoplexy to lightning, thunder to epilepsy and eclipses to fainting spells*: he therefore suggests that when Donne writes,

*these earthquakes in himselfe sodaine shakings; these lightnings, sodaine flashes; these eclipses sodaine offuscations, and darknings of his senses.*<sup>54</sup>

that he has borrowed these similes, based on the Universal Analogy from Paracelsus. As further evidence of Donne's faith in Paracelsianism, Allen cites the doctrine of *intrinsic balsam*: Paracelsus believed that every living thing on earth contained its own intrinsic antidote to its own intrinsic and also extrinsic poisons; an animal would therefore continue to go on living until this *intrinsic balsam* was exhausted; similarly if one had a malady but the balsam was not all spent, that one would be cured so long as rules were followed which allowed the balsam to work. Donne refers to this in the *First Anniversary*:

*Sicke World, yea dead, yea putrified, since shee  
Thy' intrinsique balme, and thy preservative  
Can never be renew'd, thou never live.*<sup>56</sup>

He also refers to it in prose in an epistle to Lady Bedford, and in two of his sermons, in which his accounts of "*Balsum naturale*" in wound healing are taken directly from Paracelsus' *Chirurgia Magna*.



In his *Verse Epistle to Sir Henry Wotton*, Donne compares the purgation theories of Galen and Paracelsus, to the advantage of the latter.<sup>57</sup>

*Onely in this one thing, be no Galenist; to make  
Court's hot ambition wholesome, do not take  
A dramme of Countries dulness; do not adde  
Correctives, but as chymiques purge the bad.*<sup>58</sup>

To cure a distemper arising from too much heat, the Galenist's remedy would include a corrective formed from cold. Contrastingly, however, the Paracelsian would purge away the heat with hot chemicals. In the above example, John Donne supports the Paracelsians, urging that the cure for *Court's hot ambitions* is not to add even the smallest amount (*not ... A dramme*) of cold *Countries dulnesse*, but to purge away the excess heat with chemicals.

Allen does point out however that *Ninety per cent of Donne's medical allusions belong to traditional medicine and have no Paracelsian flavor about them.*<sup>59</sup> In fact the small praise accorded to Paracelsus was not characteristic of most of Donne's literary contemporaries who on the whole considered him a charlatan. Jonson, Dekker and Beaumont and Fletcher are less than complimentary. Robert Greene (1587) mentions Paracelsus scathingly in his *Tritameron*. When Silvester is trying to impress the lady *Lacena* by his bluster, he says,

*And like an obscure Paracelsian,  
thrust a multitude of contrarie simples" into one confection.*<sup>60</sup>

In other words, Paracelsians didn't really know what they were doing. Gabriel Harvey (1593) too is hardly flattering: In the *Precursor to Pierce's Supererogation* he mentions,

*Copernicus a shrimpe ..... Paracelsus a scab.*<sup>61</sup>

Shakespeare (1600), however, is less critical and in fact remains characteristically equivocal. He is aware that there is a growing body of medical opinion favouring Paracelsianism and refuting Galenic orthodoxy, and that this had given rise to two camps - the conservative Galenists (including the College of Physicians) and the radical Paracelsians. In *All's Well*

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<sup>58</sup> *Simples* refers to remedies which contain one single active ingredient (usually, but not always, derived from plant materials).

*That Ends Well*, however, he is typically non-committal: he implies that Galenists are fatalistic and diagnose serious disease as incurable, but that the Paracelsians are *philosophical persons* who *make modern and familiar, things supernatural and causeless. Hence it is that we make trifles of terrors*. He says that it were best that we were relinquished by these scholars *both of Galen and Paracelsus*.<sup>62</sup>

The *Argument* (Preface) to Milton's *Samson Agonistes* (1671) avers:

*Nor is Nature wanting in her own effects .... for so in physis, things of melancholic hue and quality are used against melancholy, sour against sour, salt to remove salt humours.*<sup>63</sup>

Samson's visitors certainly treat him with particularly strong doses of remorse, thereby increasing his anguish to the depths of despair. This homeopathic process (even though the amount in this case seems far from minimal) destroys the Samson's old sinful self and makes him ready for spiritual regeneration. In a paper examining *Relations between Alchemy and Poetics*, Sadler comments on the end of this particular poem, in which Samson undergoes a metamorphosis from a blind man .... *and thought extinguished quite* through a dragon and an eagle to a phoenix can be viewed as *the regenerative process of spiritual alchemy*.<sup>64</sup> Henry Vaughan, the Welsh physician poet, some years later (1655) expressed strong disapproval of Galen in his prose book on *Hermetical Physick*.<sup>65</sup>

In this section, evidence is cited for John Donne's knowledge of Paracelsianism. Paracelsus is ridiculed by Donne in his satirical fantasy, *Ignatius, His Conclave*. Donne makes two more references to Paracelsus in his Sermons, and in two poetic references. In the first verse reference to Paracelsianism, Donne alludes to the theory of Intrinsic Balsam; the second poetic quote first implores the reader to *Be No Galenist*, and goes on to suggest the use of chemical purgatives. Greene and Harvey are insulting to Paracelsus. Shakespeare is non-committal. Although there is a small amount of evidence in *Samson Agonistes* that Milton appears to support the *similia similibus* theory, he gives no direct reference to Paracelsus. Vaughan, however, does so but is disapprobatory. The poets quoted above (Donne, Jonson, Dekker, Beaumont and Fletcher, Greene, Shakespeare, Harvey and Vaughan) are all aware of

Paracelsus' theories. Although only a few of the references quoted are in fact poetical, apart from the faint praise accorded by John Donne, the remainder are at best unimpressed. As stated in the previous section, although Galenic concepts were under challenge in the 17th century, they were certainly far from moribund.

## II. 10. COMEDY OF HUMOURS

Derived from the physical idea of humoral theory, literature became full of metaphors and allusions and the word *humour* came to take on a totally different and very specific meaning at the turn of the 17th century. The word became very modish and it was used *in connection with a sort of mechanistic psychology that the satirists delighted in.*<sup>66</sup> It was derived from the concept that one's *humour* was the result of the imbalance of the four Galenic fluids to give an imbalanced temperament or *a fixed folly or vice, or a mood or tendency, a disposition or caprice.*<sup>67</sup> It was the extreme depressive melancholic or the hot-blooded choleric epitomized by the fiery soldier or the black-hatted melancholic that the literists wanted to portray.

George Chapman wrote a *Humorous Day's Mirth*, (1599) in which *humorous* does not mean *amusing* but *subject to one of the bodily humours.*<sup>68</sup> Shakespeare's reference to a *humorous man*<sup>69</sup> in *Hamlet* (1596) does not mean that he is droll but *a sort of dramatic artefact made on a pseudo-scientific principle and not out of observation of real human beings.*<sup>70</sup>

A dramatic genre most closely associated with the English playwright, Ben Jonson known as *The Comedy of Humours* developed. In his play, *Every Man out of His Humour* (1600), Jonson explains that the Galenic humours may by metaphor be applied to one's disposition so that a peculiar quality may take possession of the individual to such an extent that one will act in a particular way. There is a strong feeling now that the four elemental fluids, so important to Geoffrey Chaucer have been reduced to farce. Nor were humour characters restricted to the four extremes of melancholic, sanguine, choleric and phlegmatic. These polar types were just the basis of the idea. For example, in Marston's, *The Scourge of Villanie* (1598) the humours are depicted by *Curio*, mad on dancing; *Luscus*, fanatical about the theatre; *Martius*, mad on fencing; *Tuscus*, an inveterate joke-teller; *Torquatus*, a riding expert; *Musus*, a critic; *Luxurio*, a profligate; *Piso*, a dedicated follower of sartorial fashion;

### Jonson offers a definition of Humour in his Introduction

Jonson surely knew of the important Galenic qualities of Cold, Hot, Moist and Dry, and must therefore be ridiculing the orthodox medical theories. He makes a point of saying specifically that *choller, melancholy, flegme, and bloude* by very reason of their fluxure *Receive the name of Humours*. It is also very significant that (in line 16) he goes on to say the word now may by Metaphore be applied to the personality. We are now left in no doubt by the way the word *humour* is defined here by Jonson that his humours bear little other than an evolutionary resemblance to the ancient theories of Hippocrates and Galen. Jonson and the other "Comedians of Humour" are satirizing Galenic humoral theory, particularly with respect to the temperaments which were formerly so important to Chaucer and Harington.

Throughout the whole series of the Comedy of Humours, one does not get a strong impression that humours as actual bodily constituents are being taken very seriously. Far from it, Shakespeare actually pokes fun at this popular use of the term through *Nym* in the *Merry Wives of Windsor* in 1601.

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As a physician Collop would have a deeper knowledge of humoral theory than most. He indicates his familiarity with the subject in line 2, *Nature from discords produce harmony*: this concept has been explored at the beginning of this chapter (II.1 and II.2). Phineas Fletcher (1633) tells us further in the *Purple Island* how the chaos before the Creation was resolved by God's Will to love when the four battling elements formed the World:

*Fire, Water, Earth and Aire (that fiercely strove)*

*His sovereign hand in strong alliance ti'd,*

*Binding their deadly hate in constant love.*<sup>74</sup>

Collop echoes this concept in *harmony from discords*. This idea is also closely related to music as well as poetry; thus, Spenser also says in *The Faery Queen*, *So discord oft in Musick makes the sweeter lay*.<sup>75</sup> When in line 5, Collop says that *Phlegm ... scarce bloods nature takes*, he is referring to the transmutation concept of Plato that the four humours constantly changed into one another. In Collop's poem, Plato's eternal circle is not completed, however; the *Phlegm* turns to blood, and thence to yellow *Choler*; the yellow bile then mutates to black choler and there the progression ends - *see where perfection ends*. The word *concoction* here in line 9 is a Galenic term used to describe the process of the formation of vital and animal spirits from the natural spirit in the ingested food. Collop is clearly ridiculing the humoral theory. His short poem pokes fun at a thesis which would make the perfection of nature a state of melancholy. This is what line 12 refers to: after the sarcastic cutting line preceding, Collop implies that the so-called perfection is either a state of depression (*mopish*) or even manic depressive psychosis (*mad to be*)! There can be no doubt whatsoever that our physician poet is totally satirizing humoral theory in a good attempt to discredit it.

The following poem in his book is called *On the Elements* which perhaps not only further underlines his scepticism of Galenism but also points out the dissension and revolutionary arguments going on between contemporary physicians. His poem ends,

*Things different are, but nothing contrary is,*

*But as intended, or it is remisse.*

*Ah! why should Med'ciners in their art agree,*

This shows Collop's healthy love of argument and the fact that he considers it good to question colleagues and disagree with them. Collop refers to van Helmont in more than one of his poems. In one ode directed against Noah Biggs, (vide infra. III.11) he satirizes Helmont's theory of ferments (It was shown above in section II. 9 that van Helmont considered that digestion, nutrition and movement are all caused by *ferments*, which, in six stages convert dead food into living flesh).

*Yet while he's gleaning up van Helmont's scraps  
And the Dutch hogs head long since broch'd new taps,  
Had he apprentice to an Alewife been,  
By yest fermenting ale he had more seen.  
The humors to ferment had better shown  
Then what Van's stronger phancy brews or's own.<sup>77</sup>*

Collop suggests if Helmont had been an alewife (who in the 17th Century did their own brewing), he would have known all about fermentation, which the "chymical physician" thought was so important to medicine. He continues the metaphor by reference to a *Dutch hog's head*, which is a pun, following the brewing theme, to a 54 gallon beer cask, but also refers very scurrilously to van Helmont's origin from the Low Countries (although in fact his birthplace was Brussels rather than Holland).

In another poem dedicated entirely to van Helmont, Collop pours on more satire:

*In Helmont's Paradise there's of life a tree  
By fruits of knowledge we may blinded be.<sup>78</sup>*

This is a clear reference to van Helmont's experiment mentioned above (II.9) in which he "proved" his idea that water was the chief, if not the only, constituent of matter by growing a tree in a measured quantity of earth. Collop here is comparing the tree of knowledge in the Garden of Eden with Helmont's tree. In the Genesis story, after Adam and Eve had eaten the fruit, *the eyes of them both were opened*,<sup>79</sup> but Collop sarcastically says that by the so-called knowledge from Helmont's tree, *we may blinded be* - to the truth! He ends *On van Helmont*,

*But oh! while errors troops Van rashly charges,*

*Error him captive takes, who truth inlarges.<sup>80 w</sup>*

Paracelsus does not escape the cutting wit of Collop, and he is mentioned in more than one poem. In a poem entitled "*The fugitive Chymick*", Collop leaves us in no doubt that he is not in favour of the alchemical approach to medicine.

*The Knave turns quack too, blow's the chymist coal;*

*As if each blast, inspired their Theophrasts soul.*

*He talks of salt without a grain of it;*

*But Mercury's sure ith' lightnesse of his wit;<sup>81</sup>*

*Theophrast* is Paracelsus who states man is made of three basic substances - salt, mercury and sulphur. In line 3, the first of the three principles is inveighed: *without a grain of salt* implies *without any truth*, in the next line, *Mercury* is satirized, since far from being light, quicksilver is a very dense, heavy metal.

Abraham Cowley, (1618 - 1667) was also medically qualified, but he never practised medicine, and disappointingly gives us very few allusions to it. I was able to find only one possible reference to the humours in his work: In his second book of *Pindaric Odes*, (1656) he refers to humours in his *Notes*, and this is far from definite:

*Gowts, and such kind of Diseases proceeding from moysture, and affecting one or some parts of the Body, whereas the Dropsie<sup>x</sup> swells the whole. Inundation signifies a less overflowing than Deluge.<sup>82</sup>*

This is referring to his *Ode to Dr. Scarborough* in which he states:

*The Inundations of all Liquid pain*

*And Deluge Dropsie thou doest drain.*

It is extremely doubtful that Cowley's use of the word, *moysture*, here can be cited as

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<sup>w</sup> In this last line *inlarges* means *set free*.

<sup>x</sup> *Dropsy*. syn.*hydrops*. a pathological collection of fluid in the tissues, especially ankles, feet, genitalia and abdomen.



evidence for any conviction on his part in Galenic theory. A modern physician might well talk of fluid in the tissues or in a joint without any allusion to the humours. Although it is unlikely that Cowley's references either support or refute the status of humoralism in the late 17th century, his verse certainly does, however, give us an insight into the medical nomenclature of the era and work of a doctor. It is interesting to note that Dr Scarborough had to drain joints and also swollen bellies (*dropsies*). There was also a definite and clear differentiation between the word *deluge* and *inundation*, the former being the greater.

There is little doubt that the poetic references to humours in this last section go far beyond mere scepticism: they ridicule humoral theory. Even William Shakespeare is poking fun at it through Nym. By the 17th century, the absolute faith expressed by Chaucer had been eroded by the progress of ideas and some poets in the 17th century were beginning to refuse to accept unproven dogma.

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## **CHAPTER III**

### **ON IATROMATHEMATICA\*** **(ASTROLOGICAL MEDICINE)**

*Our remedies oft in ourselves do lie*

*Which we ascribe to heaven: the fated sky*

*Gives us free scope: only doth backward pull*

*Our slow designs, when we ourselves are dull.* <sup>1</sup>

Wm SHAKESPEARE

#### **III. 1. BASIC PRINCIPLES OF WESTERN ASTROLOGY**

Astrology is defined as *the practice of interpreting the effects of the planets and stars on earthly affairs and is mainly concerned with the prediction of events by means of deductions from the relative position of the heavenly bodies at a given moment.* <sup>2</sup> It was shown in Chapter I how the Universal analogy was fundamental to mediaeval philosophy. Astrology was an essential part of this concept: the whole world was thought to be alive and have its own mind; man was thought to be a microcosm of this Universe and believed to interact with and relate to it. It was postulated in the last chapter (sections II.4 and II.9) that as a correspondence of the macrocosm in which he lived, man's humours would correspond to the seasons of the year; therefore, a summer birth would produce a (hot, dry) choleric temperament whereas spring (hot and wet), which was the time of year when the sap began to rise would breed an outgoing sanguine complexion.

It is not a big step from this philosophy to posit that movements and positions of the

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\* *Iatros* is Greek for *physician* and *mathematik - (os)* means *disposed to learn* from the stem of *mathema, learning*.

sun and moon and stars are linked with lives and actions of individuals. The term '*cosmic sympathy*' which is of Stoic origin has been used which explains it succinctly viz:

*Astrology is seen for what the Greeks made it, a rational attempt to map the state of the heavens and to interpret that map in the context of that 'cosmic sympathy' which makes man an integral part of the Universe. Nothing happens to man outside, apart from the cosmic sympathy.*<sup>3</sup>

In *Medicine and Society in Later Mediaeval England*, Rawcliffe points out that it was from the 12th century onwards that *the great bulk of Greek scientific, philosophical and medical writing* came to England.<sup>4</sup> She asserts that it was at this time that Christendom was also first exposed to the major astrological texts of the Greek scholars. Although Rawcliffe points out that *the formidable reputation posthumously acquired by Hippocrates of Cos had little factual basis*, there is little doubt as to his standing as a leading authority in the period. The Hippocratic Corpus was mentioned above (vide supra II.1). The Island of Cos was certainly the home of the Hippocratic School of Medicine and it is thought that *Cos was at least one of the places where the introduction*<sup>5</sup> of the primitive "proto-astrology" of Babylon and Egypt was made into Greek Medicine. The Hippocratic Corpus *Air, Waters and Places* firmly asserts that "astronomy" is of the greatest assistance to medicine and further urges the physician to be *familiar with the progress of the seasons and the dates of risings and settings of the stars*<sup>6</sup> to improve his diagnostic and therapeutic skills.

In the second century AD, Ptolemy (fl.AD 127-145) wrote *Almageste* and *Tetrabiblos*, Ptolemy is most widely known as a geographer and astronomer, but his *Tetrabiblos* established him for many centuries as the foremost Greek astrologer. Ptolemy's outstanding contribution was that he collated and systematized astrology and that his four books are informed with the philosophical, astronomical and



mathematical spirit of his age. The primitive astrology is refined by Pythagoreanism with its number symbolism, and Stoicism with its cosmic sympathy and the universal rule of fate. Ptolemy often refers to his predecessors but always gives his own conclusions and summing up. Tester acknowledges the great debt astrology owes to Ptolemy: he asserts just how little astrology changed during its journey from the Greek world through Islam and back into the West in the twelfth century: even in the Renaissance it preserved its conservative Ptolemaic character.

The basic principles of Ptolemaic astrology, in common with contemporary astronomy, assume the earth to be at the centre of a geocentric universe which is a vast hollow sphere, *the celestial sphere*, on the inside of which the stars appear to be fixed but rotating. These stars together with the Sun apparently rotate once a year. This apparent yearly path of the Sun in the sky is known as the *ecliptic*. The concern of astrology is less with the stars, however, than with the planets, whose positions in the heavens are determined in relation to the fixed stars. The signs of the Zodiac are made by the stars which move in their fixed order across the celestial sphere, whilst the planets wander eccentrically though in much the same plane against the stellar background.

### III. 2. CHAUCER AND ASTROLOGY

There can be no better example of the importance of astrology to medicine in the later mediaeval period than the report drawn up by the foremost physicians in France for King Phillippe VI. In 1348, he had requested the Faculty of Medicine at Paris University for an account of the cause of the Black Death which was ravaging his country at that time. The experts were in no doubt. The epidemic was inevitable after one o'clock in the afternoon on the 20th March 1345. This precise time was when a conjunction of three planets took place in the house of Aquarius. In *The Black Death and Men of Learning*, Campbell tells us:

*The conjunction of Saturn and Jupiter brings about the death of peoples and the depopulation of kingdoms.... The conjunction of Mars and Jupiter causes great pestilence in the air....*<sup>7</sup>

The famous medical school of Montpellier concurred. Their *Tractatus de Epidemia* (1347) underlined the evil conjunction and gave further astrological explanations for the haphazard spread of the pestilence through the country.

"The Father of English Poetry", Geoffrey Chaucer was a committed believer in the 'science' of astrology. *No other poet has ever turned astronomye to such account as did Chaucer.*<sup>8</sup> He actually wrote a *Treatise on the Astrolabe* to explain its workings for his young son, Lewis, on the occasion of his fourteenth birthday. This has been described as *the first competent work on the subject*. Chaucer's knowledge of astrology is encyclopaedic and as such he gives us many references, some indicating the importance of the stars and their conjunctions to medicine and disease: In the *Man of Law's Tale* he tells of the tragic suffering of Constance as a conjunction of Mars and Luna in Scorpio; In the *Nonne Prestes tale*, he alludes to the need for careful astrological timing to prevent a distemper of *humors hote* becoming *a fever terciane* or ever an *agu*. In the *Prologue*, he describes the *Doctour of Phisik* as an excellent physician because of his astrological training, viz.

*In al this world ne was ther noon him lyk  
To speke of phisik and of surgerye;  
for he was grounded in astronomye.*<sup>9</sup>

Chaucer uses the word *astronomye* here: The Greeks accepted astronomy and astrology from the Babylonians and used the same word, *astrologia* for both. St Isidore of Seville was one of the first writers to make any demarcation in the seventh century AD, but his differentiation is only slight<sup>10</sup> and had little impact: indeed in the *History of Western Astrology*, Tester says,

*The essential point is that no-one in the middle ages or for centuries after made*

*any real distinction between what we call astronomy, and what we call astrology:*<sup>11</sup>

When the distinction was made astrology was held to be as valid a subject as astronomy (vide infra. III.5).

The pomposity of Chaucer's doctor was mentioned above (II.6) and shortly after his introduction we hear him quote a catalogue of fifteen authorities with whom he was well acquainted.

*Wel knew he the old Esculapius,*

*Olde Ypocras, Haly and Galyen,*

Aesculapius (Gr. Asclepios), the first name on the doctor's impressive list, was the classical god of medicine. There are two possible reasons why the leading name on his list of authorities is mythical. Curry (1926) suggests that the description of the *doctour* by Chaucer is an indirect discourse on the physician's own egocentric view of himself.<sup>12</sup> The impressive phrases and sundry list of authors which roll off his tongue may all be as mythical as the included writings of Aesculapius. Others, however, suggest that during the mediaeval period, Aesculapius was popularly believed to be the author of several medical books.<sup>13</sup> *Olde Ypocras* refers to Hippocrates and the important emphasis he puts on iatromathematica is given above. *Haly* refers to Albohazen Haly who wrote *The Distinguished Book on Horoscopes from the Constellations*. *Galyen* refers to Galen and the importance he placed on astrology is given below (III.5). Chaucer makes further reference to Hippocrates and Galen in the *Book of the Duchess*: the *Man in Black* is so sick that no-one can cure him, not even them. He says,

*Ne hele me may no physicien*

*Noght Ypocras ne Galyen;*<sup>14</sup>

The authorities Chaucer chooses here are all confirmed believers in iatromathematica.

Chaucer refers to Ptolemy himself in a number of his poems and it has been suggested that *Tetrabiblos* was the main source of his extensive astrological knowledge.<sup>15</sup> In the *Miller's Tale*, *Nicholas* has a copy of the *Almageste*, and in the *Wife of Bath's Prologue*, Dame *Alys* quotes two of *Ptholome's* proverbs. In the *Man of Law's Tale*, in a manner reminiscent of the Paris Medicine Faculty's explanation of the cause of the Black Death, Chaucer blames the whole tragedy of *Constance's* suffering and unsuccessful marriage on *the cruel firmament* before it even took place. He says:

*O firste moeving<sup>b</sup> cruel firmament*  
*Thy crowding set the heven in swich array*  
*That cruel Mars hath slayn this marriage.<sup>16</sup>*

He even goes on to blame the Roman Emperor for not checking with an astrologer first.

Chaucer also makes reference to the libertine, *Nicholas*, in *A Miller's Tale*. We are told that this Oxford scholar could *laten blood and clippe and shave* (he was a barber-surgeon). When Chaucer builds for us a picture of him, however, he lets us know he was an intelligent capable man by informing us that he was an astrologer.

....*ther was dwellinge a poure scoler,<sup>c</sup>* 3191  
*Had lerned art, but al his fantasye*  
*Was turned for to lerne astrologye,*  
*And coude a certeyn of conclusiouns,*  
*To demen by interrogaciouns,<sup>17</sup>*

In the same way, Chaucer reassured us in the Prologue that *in al this worlde ne was ther noon ... lyk the Doctour, for he was grounded in astronomye*. In short, Chaucer is using the accolade of having a good knowledge of the stars (he uses astronomy and

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<sup>b</sup> *first moeving* here refers to the *primum mobile* (see l.1)

<sup>c</sup> In line 3191 *poure scoler* is *poor scholar*; *fantasye* in the following line means *fancy* or *desire*. 3194 to 3195 can be interpreted as *he could predict definite conclusions by his (astrological) calculations*.

astrology indiscriminately, as seen here) as being a highly educated and intelligent person.

### III 3. THE MEDIAEVAL SCIENCE OF IMAGE MAKING

Chaucer said his Doctour of Physik was a *verray parfit practisour*,

*He kepte his pacient a ful greet deel*

*In houres by his magic naturel.*<sup>18</sup>

This business of *natural magic* and keeping the patient *in houres* is a direct reference to the most favourable astrological times to administer medicines or perform surgery. It has been translated very accurately into modern English thus,

*He watched his patient closely for the hours*

*When, by his horoscope, he knew the powers*

*Of favourable planets.*<sup>19</sup>

Of all these "planets", the most important were probably *Luna* and *Sol*, the *Moon* and the *Sun*. If disease was *acute* (i.e. *short* lasting no longer than a month) it would be "*judged*" by *Luna*. *Chronic* diseases (i.e. more than a month) are "*judged*" by *Sol*.

The *hours* of Saturn and Mars are calculated from the horoscope, as are the *hours* of Jupiter and Saturn. The former two were thought to be malignant forces but the latter two benign. The situation is further complicated by different humours having ascendancy during different hours (e.g. blood is ascendant during the first six hours of the natural day i.e. after midnight, and phlegm during the last six). Generally speaking, it was said that phlebotomy should be used in the first and third quarters of the moon, but laxatives would be likely to be more effective in the second and fourth quarters. In Nicholas Culpeper's *Complete Herbal*, Culpeper attributes herbs to which diseases they cure. Agrimony was good for hepatitis and since Jupiter rules the liver, Jupiter *ipso facto* "ruled" agrimony. For herbs to be most effective they should be gathered on their planet's day, particularly during their planet's *hours*. This is why it was such a

complicated business to keep the patient *in houres* at which Chaucer's Doctour was evidently so proficient.

Curry, in his treatise on *Chaucer and the Mediaeval Sciences*, delineates the above problems facing the physician and after reviewing the decumbiture, the horoscope and the various considerations about the *houres*, he concludes by saying,

*And if your practising physician is exceptionally wise, he will concentrate and perpetuate the beneficent influences of the above in an astrological image.*

*Chaucer's Doctour at least, knowing that the science of images is the very cream of all the other sciences and of philosophy has prepared himself to 'fortunen the ascendant of images for his pacient.'*<sup>20</sup>

The mediaeval doctrine of *signatures* has been examined in Capit. I. As an indication of mediaeval man seeking to find some key to the unity between the macrocosm, geocosm and microcosm, the concept of *signatures* (together with that of *correspondences*, *epitomes* and *abridgements*) developed. One of the relevances of this theory to medicine is that of signatures in herbal medicine: heartsease was thought to be good for the heart, walnuts efficacious in brain wounds and so on. (vide Capit. I) Associated with this concept and linking it with astrology is the so-called science of image making.

Curry avers *The science of image making is the ultimate step in the sciences of nativities and elections* and he gives instructions for the making of several useful and marvellous images. If, for example, you wish to drive out Scorpions from a location, wait to begin your operations when Scorpio is in the Ascendant. Then make an image of a scorpion.

*out of copper or tin or silver and engrave above the image the names of the ascendant, of the lord of the ascendant, of the lord of the day-hour, and of the moon (luna should be in Scorpio). And you shall place in a fortunate position*

*(fortunabis) the lord of the house of death or join him in quartile or sextile aspect with one of the infortunates, Saturn of Mars. Then bury the image, head-downwards and say these words, "Haec est sepultur illius, vel speciei illius, et non intret illum, vel illum locum."<sup>d</sup>*

It was this "science" of image-making that Chaucer is referring to when he talks of the Doctour of Phisik:

*Wel coude he fortunen the ascendant  
Of his images for the pacient*

It is perhaps worth commenting here that Professor Skeat, the noted Chaucerian scholar translates this couplet into modern English thus:

*He knew well how to choose a fortunate  
ascendant for treating images.<sup>21</sup>*

The translation of Cogill is clearly more accurate.

*When by his horoscope, he knew the powers  
Of favorable planets, then ascendant,  
Worked on images for his dependent.<sup>22</sup>*

Because of Chaucer's immense knowledge about astrology, it is hardly surprising that he gives us so many references to the "science" in general. In addition he gives us a few allusions to its application to medicine in particular. These poetical references of Chaucer emphasize the importance of iatromathematica to fourteenth century medicine, and underline the contention that poetry illustrates the level of medical knowledge outside the profession.

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<sup>d</sup> *Here is the burial of them. Let them not come back, neither that species, nor to this place.*

### III. 4. THE IMPORTANCE OF ASTROLOGY IN THE TRAINING OF PHYSICIANS

Hippocrates himself (460-377 BC) is credited with having said:

*The medical man, whatever else he may be, cannot be considered a perfect physician if he is ignorant of astronomy (sic); no man ought to commit himself into his hands.*<sup>23</sup>

Aristotle (BC 384-322) is quoted in *Auctoritates Aristotelis* as from *de Generatione et Corruptione*<sup>o</sup> as saying quite clearly that:

*The movement of the sun and other planets in an oblique circle is the cause of the generation and corruption of sublunary things.*<sup>24</sup>

Aristotle's influence on mediaeval thought fifteen centuries after this was very important and from the twelfth century onwards Aristotle's ideas on *scientia* or knowledge were generally accepted. For more than two hundred years Aristotelianism was the background philosophy of all educated men. *Secretum Secretorum*<sup>i</sup> was a popular mediaeval text and allegedly Aristotle's advice in a letter to Alexander the Great. In the *Secretum*, Galen (129-210 AD) is said to be wholly committed to the importance of iatromathematica. The book has been erroneously attributed to Roger Bacon, the noted 13th century philosopher: although Bacon did not write *Secretum Secretorum*, he was certainly greatly influenced by it: he states that a physician cannot make compound drugs unless he is *thoroughly cognizant of astronomy*,<sup>25</sup> (which he did not distinguish from astrology).

John of Burgundy (who may have been Chaucer's role model for the *Doctour of Phisik* in the *Canterbury Tales*) in fact complains that some doctors are ignorant of astrology, and implies they are not fully competent:

*Ther have bene many grete maistirs and ferre lernyd in theoric and speculation and groundly in sight of medecyne, but they bene litill proved in practik and*

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<sup>o</sup> Concerning the Birth and Decay.

<sup>i</sup> *The Secret of Secrets*



*therto allefully ignorant in the sience of Astronome, the which sience is in phisik wonder nedefull.* <sup>26</sup>

It would seem that medicine has always been regarded as a special case with respect to astrology: in the middle of the 12th Century, Peter the Deacon (also called the Philosopher) is scathing about the *old astrology of the Greeks*; in the same letter, he justifies the use of astrology in medicine (*iatromathematica*). St Thomas Aquinas (1225 - 1274), perhaps the greatest of all Christian theologians was one of the outstanding mediaeval figures to endorse astrology in general and the value of astrology in medicine in particular.

In *History of Magic and Experimental Science*, Professor Lyn Thorndike quotes William of England in whose work, *de Urina non visa*<sup>g</sup> we are told it is even possible by astrology to diagnose a medical case and tell the colour (and consistency) of the urine.<sup>27</sup> Paracelsus (1493 -1531) too was convinced of the value of astrology; he is said to have thought that, *The causes of disease were to be found in minerals and in the atmosphere, which conveyed the poisons produced by astrological influences.*<sup>28</sup>

In 1505, the Regulations of the Burgh of Edinburgh required that a barber or surgeon in that city should be familiar with the *domination* of astrological signs over parts of the body so that the should not harm his patients.<sup>29</sup> In 1518, Linacre's English School of Medicine<sup>h</sup> and the founding of the Royal College of Physicians *probably tended to strengthen the popular belief in astrology and astrological physicians*. The more usual division of the "science" was into the two branches, natural and judicial. Natural astrology merely predicated the planets and the moon and the tides (interestingly the

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<sup>g</sup> lit. *concerning Urine not seen*.

<sup>h</sup> Henry VIII granted a royal charter to a group of keen academic (predominantly court) physicians. This *Collegium* during the early years met at the home of Dr Thomas Linacre. The pooling of medical knowledge was thought to be beneficial to the monarch in combatting the plague which had broken out that year. Similar corporations of physicians had been formed in Europe prior to this.

only medical influence was the effect of the moon on the menstrual periods and the insane). Judicial astrology concerned prediction and iatromathematica belonged to the judicial branch. Dr John Halle (1529 - 1566), was a surgeon-poet who practised at Maidstone in Kent. He was another radical who wrote much against contemporary medical practices, but interestingly considered astrology a very definite necessity for a practising surgeon. He informs us:

*A good physitian who so intendeth to be,  
Our lower astronomy him nedeth well to know.*<sup>30</sup>

Leonard A. Digges, father of the famous late 16th Century astronomer, Thomas Digges, wrote a book on Astrology in 1555 entitled *A prognostication of right good effect*. This book's popularity is testified by the phenomenal number of reprints it went into - 1555, 1556, 1564, 1567, 1576, 1578, 1583, 1585, 1592, 1596 and 1605. The later editions were called (perhaps appropriately) *A Prognostication Everlasting*. In the first edition, Digges warned phlebotomists,

*These signes are most daungerous for bludde letting, the Moone beying in  
them: Taurus, Gemini, Leo, Virgo, and Capricorne, with the laste half of  
Libra, and Scorpius.*<sup>31</sup>

Francis Bacon (1561 - 1626), was vociferous in his condemnation of all forms of astrology in his *Novum Organum*<sup>1</sup> of 1620, but once again, he appears to make *iatromathematica* "a special case", and does not attack it. In *Anatomy of Melancholy* (1621), Burton says,

*Paracelsus is of opinion, that a Physician without the knowledge of stars can  
neither understand the cause or cure of any disease.*<sup>32</sup>

There is no doubt of the importance placed on astrology in medicine in the middle

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<sup>1</sup> *New Instrument*

ages. Astrology was an important part of the medical syllabus at Universities. In the University of Bologna, the Professor of Astrologia taught astrologia, until the middle of the 14th century then astronomia but *the material was always the same*.<sup>33</sup> In 1639 in Bologna, Bonaventura (1598 - 1647) published a *Nuova pratica Astrologica*<sup>j</sup> which was based on Kepler's work and even as late as 1799 the professor (now of astronomy) at Bologna was still required *conficiat tacuinum astronomicum ad medicinae usum*.<sup>k</sup>

William Harvey, the physician whose discovery of the circulation of the blood was to eventually revolutionize medical thought, and whose University medical education was from 1593 to 1602, certainly studied astronomy but it is not certain whether this part of his medical education was completed at Cambridge or Padua. When Harvey published his theory in 1628, he presented his circulation of blood as an analogy of the circulation of the heavens (in a Copernican model with the sun at its "heart"): this is an excellent example of the microcosm macrocosm correspondence described in Capit I. (see also V.7)

There seems to be little doubt that at the beginning of the seventeenth century the majority of medical orthodoxy believed strongly in the ancient Hippocratic tradition of the importance of astrology to medicine.

### III. 5. IATROMATHEMATICA IN ELIZABETHAN POETRY

The references given above, however, have been concerned from the medical "professional" view point. Let us examine what the general view of the laity was towards this assertion by examining contemporary poetry. To quote Chaucer first is perhaps to weigh the argument heavily in favour of the astrologers. It has already been

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<sup>j</sup> *New practical astrology*

<sup>k</sup> *to make an annual medical almanac for medical use*

stated that Geoffrey Chaucer was an accomplished astrologer himself and had even published on the astrolabe. It has been shown above how the *Doctour of Phisik* put astrology to use in a practical manner. Chaucer's poetry not only emphasizes the importance of astrology to medicine in the 14th century, but underlines the premise that a study of contemporary poetry gives a useful insight into the medical theories and practices of the time.

By the 16th century knowledge of the stars was evidently still held to be a valuable attribute to a prospective physician. In 1565 Doctor John Halle advised any prospective physician:

*Not onely in chirurgery,  
Thou oughtest to be experte;  
But also in astronomye  
Both prevye<sup>1</sup> and aperte.<sup>34</sup>*

Even as late as the seventeenth century, it appears that same idea persists. Philip Massinger portrays a Doctor in his *A Very Woman* (1634) who, when asked for his credentials, says,

*I promise all the skill I have acquired  
In simples, or the careful observation  
Of the Superior Bodies with my judgement  
Deriv'd from long experience, stand ready  
To do you service.<sup>35</sup>*

The Viceroy, hastened to recommend him by calling him

*A bright star of knowledge  
The honor of thy art, thou help of nature*

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<sup>1</sup> Here *prevye* (private) means the personal type of casting of horoscopes, image making and natural magic described above, and *aperte* (open) or public means the more general rules of astrology.

*Thou glory of our Academies.*

It would seem that Massinger considered astrology an important part of the doctor's armamentarium. In another play, *Parliament of Love*, the court physician, *Dinant* diagnoses thus,

*I have with curiosity considered  
Your constitution to bee hot and moyste  
And that at your nativitie, Jupiter  
and Venus weare in conjunction, whence followes  
By necessarie consequences, you must bee  
A most insatiate letcher!*<sup>36</sup>

The days of crisis and the types of astrological critical days are described above in section III.5. Christopher Marlowe, the Elizabethan poet also refers to the critical days in *Tamburlaine*:

*Besides my Lord, this day is Criticall,  
Dangerous to those, whose Chrisis is as yours.*<sup>37</sup>

The *Regimen Sanitatis Salernitatum* by Sir John Harington was introduced in the last chapter; this book also discusses the moon and phlebotomy viz:

*Three speciall Months (September, April, May)  
There are, in which 'tis good to ope a veine;  
In these 3 Months the Moone beares greatest sway,  
Then old or young that store of bloud containe,  
May bleed now, though some elder wizards say  
Some dayes are ill in these, I hold it vaine.*<sup>38</sup>

Thomas Sackville wrote a series of tragic stories in verse in 1564 called *A Myrrour for Magistrates* and after telling in the *Induction* the accepted "official line" of how the stars alter our lives:

*With nightes stars thick powder'd everywhere....*

*The sudden sight reduced to my mind*

*The sundry changes that in earth we find,*

he goes on to reveal his true scepticism of astrology and how in fact we are masters of our own will,

*It may be well that planets do incline*

*And our complexions move our minds to ill,*

*But such is Reason that they bring to fine*

*No work unaided of our lust and will;*

*For heaven and earth are subject both to skill.<sup>39</sup>*

The references in this section reinforce the conviction implied by Chaucer in the *Miller's Tale* that the English-reading public considered a sign of a good doctor was a knowledge of astrology. Halle, Massinger and Marlowe were writing at the end of the 16th century. Harington's regimen was at the very beginning of the 17th. Sackville, however, displays the definite uncertainty which had started to accompany all the new astronomical discoveries.

### III. 6. SHAKESPEARE AND ASTROLOGY

The ambivalent nature towards astrology by the Elizabethan is perhaps illustrated best of all by Shakespeare. He tells us of the importance of astrology in some of his plays, but shows a very sceptical attitude in others. Shakespeare gives us a wonderful reference to the astrological importance to phlebotomy. In *Richard II, Bolingbroke* has just challenged *Mowbray* to combat, but the wise king intervenes:

*Let's purge this choler without letting blood*

.....

*Our doctors say this is no month to bleed.<sup>40</sup>*

Special calendars were made for phlebotomists. The references given above in Section

III. 4 to image-making and the propitious times to let blood are examples of times when astrological knowledge was put to actual practical use. It was taken for granted in Elizabethan times that the stars held power over that part of the Ptolemaic universe below the moon (i.e. sublunary corruptible regions). This gave rise to a fatalism, in that there was not a lot which one could do (other than by magical means) to alter the fate which had been ordained in the stars. The Church in the 4th Century had rejected astrology averring that it denied man the divine gift of free will.<sup>m</sup> This fatalistic acceptance of heavenly power is being alluded to *Henry VI* part II (1596) when the *Duke of Gloucester*, (later *Richard III*) blames his hump-back on astrological forces:

*Then since the Heavens have shaped my Body so,*

*Let Hell make crooked my mind to answer it.*<sup>41</sup>

He reiterates this after he has seized the crown when he tells the late king's window,

*Heaven and fortune bar me happy hours!*

*Day yield me not thy light; nor night thy rest!*

*Be opposite all planets of good luck*

*To my proceeding!*<sup>42</sup>

In *Troilus and Cressida*, Shakespeare leaves us in no doubt as to the importance of celestial influences, (not only in medicine it would seem) this play was written in 1601, half a century after Copernicus had published his theory, but the astronomy is definitely geocentric. There was by the beginning of the 17th Century also the compromise of Tycho Brahe, in which the universe remained geocentric whilst having the rest of the planets (excluding the moon) revolving around the sun, which itself rotated around the earth (see also I.6). *Ulysees* says:

*he heavens themselves, the planets, and this centre* 85

*Observe degree, priority, and place,*

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<sup>m</sup> A bitter attack on astrology from Christianity was led by St. Augustine around 397 A.D. when he condemned it as demonic, pointing out that it detracted from divine power, that it implied that on occasion God exerted evil power through malignant conjunctions, and that it denied the divine gift to man of free will.

.....

*And therefore is the glorious planet Sol*  
*In noble eminence enthron'd and spher'd* 90  
*Amidst the other, whose med'cinable eye*  
*Corrects the ill aspects of planets evil,*  
*And posts, like the commandment of a king,*  
*Sans check, to good and bad. But when the planets*  
*In evil mixture to disorder wander,* 95  
*What plagues and what portents, what mutiny,*  
*What raging of the sea, shaking of earth,<sup>43</sup>*

The above quotation says quite a lot about the Elizabethan World view. It emphasizes the interconnexions between the macrocosm, geocosm and microcosm. The planets, the Sun, the king, a tempest at sea and plagues all interrelate. When the orderliness in the first four lines (ll 85-88) is thrown into *evil mixture* and disarray, storms, earthquakes and pestilence ensue. In the first line *this centre* refers to the earth. The sun, *the glorious planet Sol* is rotating around it, *spher'd Amidst the other*. Here *the other* is the moon, and it can be seen how powerful the moon is considered in the lines which follow and how evidently able to counteract malign influences of other planets.

The scepticism shown by Sackville is clearly shared by Shakespeare in *Julius Caesar* (1599), *Cassius* says,

*The fault, dear Brutus, is not in our stars,*  
*But in our selves that we are underlings.<sup>44</sup>*

In *Alls Well That Ends Well* (1602), *Helena*, the daughter of the famous physician, Gerard de Narbon, and a "healer" herself, refers to the dubious power of celestial forces in physic:

*Our remedies oft in ourselves do lie*  
*Which we ascribe to heaven: the fated sky*



*Gives us free scope: only doth backward pull*

*Our slow designs, when we ourselves are dull*

Yet she also says she feels herself that her legacy from her father, a special remedy is *sanctified By the luckiest stars in Heaven.*<sup>44</sup> *Helena* later shows herself to be far from dull; she successfully cures the King's fistula where others have failed. In *King Lear* (1606), *Edmund* points out that we use the cosmos as a scapegoat for our own misdeeds and foolishly blame the heavenly bodies for our so-called bad luck, which is often the result of our own faults,

*This is the excellent foppery of the world, that, when we are sick in fortune, often the surfeits of our own behaviour, we make guilty of our disasters the sun, the moon, and stars.*<sup>45</sup>

Shakespeare was writing some of his greatest works during the revolutionary astronomical discoveries. Two literary critics point out, however, that Shakespeare was not so interested in the intangible heavens, but more in human nature and his fellow man. Marjorie Nicolson says:

*Shakespeare must have seen the "new star" in 1604, must have heard of Galileo's discoveries of 1610, yet his poetic imagination showed no more response to new stars or a new universe than to Copernican theory.*<sup>46</sup>

Spurgeon's criticism of him, too suggests that he was far more interested in what he could see and bite than in astronomical theories: *His feet are firmly set upon 'this goodly frame, the earth' his eyes are focused on the daily life around him.*<sup>47</sup> In *Shakespeare's Imagery*, Spurgeon gives six astronomical Shakespearean references: five of them<sup>n</sup> refer to stars moving in their spheres; only in her last quotation - *Cleopatra's* anguished cry at *Antony's* funeral, *Oh sun, Burn the great sphere thou movest in*, do we have any evidence of geocentricity. She makes the assumption that

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<sup>n</sup> *Hamlet*, IV, 7, 15; *Antony & Cleopatra*, III, 13, 145; *M.N.D.*, II, 1, 153; *Hamlet*, II, 2, 141; *All's Well*, I, 1, 93 - 96.

the other references are illustrations of the *vividness and reality of the old Ptolemaic conception in Shakespeare's imagination.*

A contrary view and fascinating suggestion was made by an American astronomer, however in 1997 that *Hamlet* was the Bard's wider look at the astronomical controversies of the day: Usher suggests that the 1601 play is packed full of references to the rival theories of the cosmos, and that, *Hamlet is an allegory for the competition between Thomas Digges of England and Tycho Brahe of Denmark.*<sup>48</sup>

He claims that Shakespeare knew Digges, an English scholar and astronomer, who in 1576 in his *Perfit Description* took up the heliocentric theory of Copernicus and said that other stars are like our sun but distributed in an infinite universe. Usher suggests that Shakespeare would have known of the Tychonic compromise of Brahe through Digges, and says,

*When Hamlet states: 'I could be bounded in a nutshell and count myself a king of absolute space' he is contrasting the shell of fixed stars in the Ptolemaic and Tychonic models with the Infinite Universe of Digges. He goes on The chief climax of the play is the return of Fortinbras from Poland (Copernicus was a Pole) and his salute to the ambassadors of England. Here Shakespeare signifies the triumph of the Copernican model and its Diggesian corollary.*

Usher implies that Hamlet's uncle *Claudius* gets his name from Claudius Ptolemy, who is the personification of Ptolemaic geocentrism, whilst *Rosencrantz* and *Guildenstern* (Danes) personify the Tychonic model. When they are all killed it is an allegorical death of the geocentric universe. Other pieces of evidence in support of his theory are that *Hamlet* was a student from Wittenberg, a committed centre of Copernicanism, but when the Prince announces his desire to return there, *Claudius* says *It is most retrograde to our desire.* Usher further suggests that use of the word *retrograde* is a

metaphor for the astronomical apparent movement of planets backwards!<sup>9</sup> Although these views are clearly fanciful, they do give some indication that Shakespeare was at least aware of the current controversy.

Perhaps Shakespeare sums up the Elizabethan view of astronomy by his ambivalence. He was clearly mindful of the former importance of astrology: in *Richard II*, *Bolingbroke* refers to the importance of the stars to phlebotomy, but Richard's reign was 1377 - 1399 when astrology was considered crucial to the phlebotomist. For Shakespeare to have modified this view would have been anachronistic. Indeed, as shown above, in 1595 when *Richard II* was written, many physicians still considered astrology fundamental. The geocentricity in *Troilus and Cressida* and *Antony and Cleopatra* was likewise correct in the Roman period, but then anachronism was not a great consideration to contemporary playwrights.

Nicolson and Spurgeon both admit that Shakespeare must have known of Copernicus and his discoveries, but they both suggest he chose to ignore heliocentricity whereas Usher presents some original suggestions and posits that the Bard was not only aware of Copernicanism, but endorsed it. As discussed in Capit. I, the literate Elizabethan would have heard of the new ideas of Copernicus and Galileo, but he was as yet far from convinced by them. He was still waiting for proof. According to Tillyard *the ordinary educated Elizabethan thought of the Universe as geocentric*.<sup>49</sup> It is very likely that Shakespeare, too thought in terms of a Ptolemaic macrocosm which, as Spurgeon suggests *as well corresponds to the testimony of our senses*. Shakespeare, however, lets us know that he, like so many of his peers, was cognizant of the controversies in astronomy, but was deferring judgement. With regard to astrology, he is more definite: the old Chaucerian supremacy has gone, and he now clearly doubts and

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<sup>9</sup> Although Professor Usher is reported to say "when the stars move backwards", retrogression astronomically speaking, applies not to stars, but to planets.

mistrusts it.

### III. 7. ZODIACAL MAN

In *Twelfth Night*, (1600) the Bard pokes fun at the idea of the dominion of signs of the Zodiac over different parts of the body when the two clowns discuss it:

**SIR TOBY :**                    *I did think by the excellent constitution of thy leg it  
                                      was formed under the star of a galliard.<sup>p</sup>*

**SIR ANDREW :**                *Ay, 'tis strong, and it does indifferently well in a  
                                      flame coloured stock. Shall we set about some revels?*

**SIR TOBY:**                    *What shall we do else? were we not born under  
                                      Taurus?*

**SIR ANDREW:** *Taurus! that's sides and heart.*

**SIR TOBY:**                    *No, sir, it is leg's and thighs.<sup>50</sup>*

It is no mistake that these two buffoons got it all wrong. Shakespeare almost certainly knew that Taurus was, in fact, in dominion over the neck and throat. *Sir Toby* meant to imply revelling (dancing) with *legs and thighs*, but the use of the neck and throat for boozing is probably just as apt. Another possible explanation is that if his less educated audience did not understand the nicer distinctions of astrological anatomy, at least the vaguely salacious references to thighs and legs would raise a gratuitous guffaw in any case. Whatever Shakespeare's meaning, he is here certainly deriding astrology, and what was so very important to Chaucer is being relegated to farce.

The allocation of parts of the body to the zodiac is very ancient; according to Tester it is this part of astrology which is associated with pagan magic and superstition, and tainted with heresy.<sup>51</sup> Rawcliffe avers that the *melothesia* or *doctrine of the twelve*

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<sup>p</sup> 17th Century dance

*signs*<sup>4</sup> was introduced to Europe in the 12th century in the work of Abu Mashar (d. 887) called *Introductorium in Astronomiam*.<sup>52</sup> Whatever its origins, the Zodiacal man is an almost ubiquitous illustration in contemporary medical texts; it usually shows a picture of a human body with the signs of the zodiac superimposed at the appropriate places.

### III. 8. WHAT IF THE SUN BE CENTRE OF THE WORLD?

The confusion surrounding cosmology was discussed in Chapter I and above. The theories of Copernicus would almost certainly be known to the educated Elizabethan, but he was still waiting for proof. The new theories and ideas would doubtless be interesting but as yet nothing was 'cut and dried'. The jury was still out on heliocentricity, however fascinating and appealing it might sound. Even if it had not been universally accepted, Copernicanism had shaken the educated Elizabethan's confidence. It had caused a large measure of doubt and uncertainty. The importance of astrology to classical medicine has been underlined above (III.2,3,4,5&6). That supremacy was based on a Ptolemaic macrocosm, and a cosmic sympathy between the microcosm of man and that greater Universe. The theory of heliocentricity called all this into question; if indeed the basic theory of a geocentric macrocosm was flawed, this raised the fundamental question about the validity of astrology. Since iatromathematica is one of the cornerstones of Galenism, the very foundations of classical medicine had also been challenged.

The new discoveries in themselves had generated a popular interest in *Astronomye* in the 17th century: one of *Dr Faustus*' first demands of *Mephistopheles* was for a *booke where I might see all characters and planets of the heavens that I might know their motions and dispositions*.<sup>53</sup> Copernicus had published his heliocentric theory in 1543, but at the end of the 16th century, *Mephistopheles*' reply is still purely Ptolemaic,

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<sup>4</sup> These are names for allocation of the parts of the body to the Zodiac

showing it had neither been accepted nor perhaps understood:

**MEPH:** *As are the elements, such are the spheres,*

*Mutually folded in each other's orb,*

.....

*All jointly move upon one axletree,*

*Whose terminine is term'd the world's wide pole*

.....

**FAUST:** *But tell me, have they all one motion both situ et tempore?*

**MEPH:** *All jointly move from east to west in twenty-four*

*hours upon the poles of the world: but differ in*

*their motion upon the poles of the zodiac.<sup>54</sup>*

Galileo had been condemned after a trial in 1633 and spent the rest of his life under house arrest. Descartes, aware of Galileo's fate, suppressed his own Copernicanism, which was only published after his death in 1651. Controversy continued and was widespread and references to the new astronomy in contemporary poetry abound. In Sir John Davies' *Orchestra*, he lets us know that he has heard of the controversy about the Copernican universe, but then quickly dismisses it, pointing out that the earth certainly feels *stedfast* and *firm* under his feet:

*Only the Earth doth stand for ever still,*

*Her rocks remove not nor her mountains meet;*

*(Although some wits enrich with learning's skill*

*Say heav'n stands firm and that the earth doth fleet*

*And swiftly turneth underneath their feet):*

*Yet, though the earth is ever stedfast seen,*

*On her broad breast hath dancing ever been.<sup>55</sup>*

John Milton too knew of the Copernican heliocentric universe but did not like it. In fact his knowledge of the stars was extensive. In *Paradise Lost*, when Adam asks the

Angel, Raphael *concerning celestial motions, a treatise on astronomical systems* follows, including the lines,

*What if the Sun*

*Be centre of the World?*<sup>68</sup>

This can certainly be interpreted as a reference to a heliocentric universe, but it is still a question: what, indeed, *if the Sun be centre of the World?* He refers to Gaileo and Copernicus as *these new carmen who drive the world about*. In *Book VIII* of *Paradise Lost*, Milton refers to astronomical orbits:

*With Centric and Eccentric, scribl'd o're*

83

*Cycle and Epicycle, Orb in orb.*

In 1609, Kepler had published *de Motibus Stellae Martis*, his commentary on the planet Mars in which he showed that planets moving around the Sun do so not in circles, but ellipses. Milton is not, however, making a Keplerian reference: it is in fact still Ptolemaic, because both Ptolemy and Kepler used the eccentric and the epicycle in perfect *circular* motions (as opposed to elliptical).

From the above references, it can be seen that Milton's knowledge of contemporary astronomy (including the controversies) was therefore quite extensive, albeit not so profound as that of Chaucer's acquaintance with astrology, but whereas Geoffrey Chaucer gives us quite a few medical references in his works, I can find no allusions to iatromathematica or the effect of the heavens in medicine in Milton's works.

### III. 9. THE BREAKING OF THE CIRCLE'

John Donne, too had a broad knowledge of astronomy: Charles Munro Coffin in *John Donne and the New Philosophy* (1598) tells us that *its influence with Donne goes deeper than any other science* and *...his study of astronome is of much greater*

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<sup>68</sup> Title of book by Nicolson (1960); the subtitle is *Studies in the Effect of the 'New Science' on 17th century Poetry*.<sup>48</sup>

importance than his study of medicine.<sup>57</sup> Donne was certainly obsessed by circles and spheres: *One of the most convenient Heiroglyphicks of God is a circle* he had written, *and a circle is endlesse; His Sun and Moone and Stars move circularly.*<sup>58</sup> In the same essay, he started a prayer, *O Eternall and most gracious God, who considered in thy selfe, art a Circle first and last and altogether.* Donne was not the only 17th Century poet who used this "Circle of Perfection" metaphor: others, notably Marvell, had also used this *correspondence*, which mirrored the microcosm/macrocosm. Sir Thomas Browne, too had said *God is a Circle, whose Circumference is nowhere, and whose Centre everywhere.*<sup>59</sup> Donne had looked for circles everywhere. In his elegy, *The First Anniversary*, he refers to the perfect celestial spheres,

*We thinke the heavens enjoy their Sphericall*                      251  
*Their round proportion embracing all.*<sup>60</sup>

but goes on to point out that these circles of perfection were not his perfect metaphorical spheres at all but that astronomy had shown:

*Men to finde out so many Eccentrique parts,*  
*Such divers downe-right lines, such overthwarts,*  
*As disproportion that pure forme....*  
*For his course is not round; nor can the Sunne*                      268  
*Perfit a Circle,*<sup>61</sup>

Whether Coffin's assertion given above is valid or not, it can be seen from even the few lines from this elegy that Donne certainly was aware of contemporary astronomy; indeed he was disappointed that his important metaphor, the Circle of Perfection mirrored in the heavens was no longer valid. If he had heard of a heliocentric universe, he most certainly did not like the idea, and in *of the Progresse of the Soule*, when the departing soul flies heavenwards from earth, it passes first the *Moone*, then Venus, Mercury, the *Sunne*, Mars, and Jove -the old macrocosmic spherical system.

Another modern critic of Donne, has argued against Dr Coffin's premise of Donne's



overwhelming interest in astronomy cited above. Allen, in *John Donne's Knowledge of Renaissance Medicine* says that he *was more interested in medicine than he was in those problems of cosmology and astronomy* and that *we could almost establish a medical dictionary based on John Donne's writings*.<sup>62</sup> Clearly, whichever of these two literary critics is correct, Donne was manifestly interested in both medicine *and* astronomy, and it can therefore be assumed that he also had a thorough grasp of the contemporary controversies in medicine and a good working knowledge of the principles of Renaissance medicine. He does make many references to medicine and other critics have said his ideas are Paracelsian which implies his medical views are certainly not orthodox. Indeed he says

*Onely in this one thing, be no Galenist:*<sup>63</sup>

In view of his interests in both *the study of astronomy* and his knowledge of medicine, I find it most surprising that there appears no reference in either his verse or prose to the relevance of astronomy or astrology to medicine. Donne's failure to make any allusion to iatromathematica is as significant as Milton's in the previous section (III.9). Their very silence supports the assertion that study of contemporary verse gives insight into current medical thought. Chaucer was certainly far from silent, because in the fourteenth century the laity knew how supremely important astrology was to medicine. The relative absence of any poetical references to astrological medicine at the end of the seventeenth century clearly suggests that the significance of celestial influences had dwindled in the popular perception as well as in the professional mind.

### **III.10. IATROMATHEMATICA DERIDED AS ASTROLOGICAL QUACKERY**

Perhaps it does not come as a surprise that Dr Collop once again forges the link between astrology and quackery and does it characteristically with burning satire. He does more than just combine the two subjects, but points out that the discovery of the heliocentric universe has caused us to revise our values. Astrology is derided initially in the very title of his short poem devoted to discredit it - *On the Astrological Quack*.

*Each house<sup>a</sup> for mans use stranger herbs hath got*

.....

*But is't not strange; when they so numerous be,*

*How all do with a fewer stars agree?*

.....

*Or ist since Heav'n stand still, and earth turns round,*

*We here are giddy, there no truth is found?*<sup>84</sup>

Paracelsus, although very revolutionary in some ways, was nonetheless willing to combine his new heretical beliefs with magic, or as Webster puts it, saw *no contradiction in amalgamating acute clinical observations with insights gained from popular belief.*<sup>85</sup>

Although it can be seen from the poetic references in this and the last section, Collop had clearly relegated astrology to the unscientific minds of the superstitious and the archaic Galenists, there were still some respected physicians who adhered to the old beliefs. It can be said therefore once again that study of English poetry in the sixteenth and seventeenth Century gives an insight into the place of astrology in medicine. The great importance emphasized by Chaucer has gone. The scepticism expressed by Shakespeare at the turn of the century had once again developed into active disbelief. The whole world of astronomy had been revolutionized. Astrology's Ptolemaic foundations were no longer unassailable; moreover it would appear they were about to crumble.

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<sup>a</sup> *House* refers to the Zodiac.

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## **CHAPTER IV**

### **ON CONTAGION**

*Oh hateful, vaporous and foggy night!  
With rotten damps ravish the morning air;  
Let their exhaled unwholesome breaths make sick  
The life of purity.<sup>1</sup>*

SHAKESPEARE, Wm.

#### **IV. 1. GRAECO-ROMAN TRADITION OF NATURAL CAUSES**

The concept that diseases are caused by supernatural forces (devils, possession, divine wrath) had been firmly refuted by Hippocrates, who argued in his treatise on epilepsy, *The Sacred Disease*, that all illness is a result of natural causes.<sup>2</sup> The doctrine of the harmony of the humours was at the very root of Hippocratic medicine. These were the *naturals*. There were two other basic classes of phenomena in the *Articella*: the *contra-naturals* which were pathological conditions, and the final group were the six *non-naturals*<sup>3</sup> which were agents necessary for life: they were *vapours, food and drink, sleep, exercise, evacuations and passions of the mind*. An important feature of Humoral Theory was its so-called specificity which was intended to express absolute individuality (i.e. of persons rather than diseases). This individuality of Hippocratic medicine was later strongly reinforced by Galen who vehemently opposed any generalizing tendencies which sought similarities between diseases. The Graeco-Roman principle favoured a concept of positive good health as opposed to an absence of disease, with a delicate balance of humours actively maintained by a Regimen of Health specifically tailored to suit each individual. John Lydgate (1370 - 1451) gives advice on how to avoid the Plague by tailoring your diet to your humoral complexion

(see II.4) in his *Dietary and Doctrine for Pestilence*:

*Temperate diet kyndly digestioun,*

.....

*Food accordyng to complexioun,*

*Stondyng on <sup>a</sup>iii<sup>a</sup>, flewme<sup>b</sup> or malencolie*

*Sanguey, colre<sup>c</sup>, so conveid bi resoun<sup>d</sup>*

*Voidyng al trouble of froward<sup>e</sup> maladie.<sup>4</sup>*

#### IV. 2. SUPERNATURAL CAUSES AND THE WAGES OF SIN

Although Hippocratic and Galenic orthodoxy firmly rejected anything other than natural causes for disease, in the mediaeval period, the monasteries had acted as both the chief centres for medical treatment and also as major centres of learning, and Christianity started to blur this basic tenet of medical philosophy. The early Christian concept was that illness was punishment for sin, and that disease, like shame and guilt all followed "the Fall", that is the banishment of *Adam* and *Eve* from the Garden of Eden.<sup>5</sup> In the New Testament, Christ underlines this Judaistic idea: in St John's Gospel, he warns the cripple whom he has just successfully told to take up his bed and walk not to sin lest he fall ill again, saying *Go thou, and sin no more*, implying that it was sin which had laid him low in the first place.

In his *Short History of Medicine*, (1982) Ackernecht summarizes the consensus of views of historians of medicine on the aetiology of disease, saying, that *Christianity originally held its own theory of disease; disease was either punishment for sins,*

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<sup>a</sup> based on four (iiii) considerations.

<sup>b</sup> flewme, phlegm.

<sup>c</sup> sangey, colre, blood or yellow bile.

<sup>d</sup> conveid bi resoun, guided by reason.

<sup>e</sup> future.



*possession by the devil or the result of witchcraft.*<sup>6</sup> Eli even stated that *Writers in the Early Middle Ages lost the distinction between physical disease and sin.*<sup>7</sup> A late mediaeval poem tells us lechery and pride cause disease:

*For riht als leper mas bodi*

*Ugli, and lathe, and unherly*

*Sua mas the filth of licheri*

*The sawel ful lath, gastelye,*

*And the bolning of privy pride*

*Es leper that nai man mai hide.*<sup>8</sup>

This view, however, has been challenged by a few critics<sup>9</sup> and Kroll and Bachrach (1984), pointed out that there is some very definite evidence to refute it: they found that early medical evidence did not *sustain the common medical stereotype that madness was caused by sin*. They looked at 464 cases of physical disease referred to in secular chronicles, biographies and also hagiographies; they found that in the 224 episodes of illness in the secular reports, 21% were attributed to sin, and in the 240 saints' lives only 17% of illness was thought to be due to sin. They aver that by and large the people of Pre-Crusade Europe *understood in a practical sense that humoral, climatic, traumatic, dietary, behavioural, and psychological causes were responsible for medical illness*. In a smaller sample (158 cases) of Post-Crusade illness from matched sources, they found only 12% of illness was attributed to sin. They also concluded that mediaeval authors may have employed the claim that disease was caused by divine punishment as a "literary device".<sup>10</sup>

#### **IV. 3. EVERY SIN BRINGS ITS PUNISHMENT WITH IT<sup>1</sup>**

It was shown in Chapter II, how Robert Henryson's (c.1420-c.1506) *Cresseid* contracts leprosy as a result of her *living unclean and lecherous*. In Canto IV of *The*

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<sup>1</sup> The title of this section *Every Sin Brings Its Punishment With It* was a proverb in *Outlandish Proverbs* (1640).

*Faerie Queene* (1589), Edmund Spenser gives a catalogue of diseases attributable to sin in a delightful scene in which *Lucifera's* coach is *drawne of six unequalle beasts*<sup>11</sup> (pulled by six ill-matched beasts) and each Sin has an appropriate disease. Proud *Queen Lucifera* herself is meant to represent the personification of *Pride* and each of the beasts pulling her coach is meant to depict one of the other six of the seven deadly sins. The first is *Idlenesse*, thin, sickly and half asleep riding on a slow-moving ass.

*For in his lustlesse<sup>a</sup> limbs through evill guise<sup>b</sup>*

*A shaking fever raign'd continually.*

The causes of fever are myriad and they may all give rise to a tremor. By his side, the bloated, obese *Gluttonie* rode on a filth-streaked swyne.

*Full of diseases was his carcas blew<sup>i</sup>*

*And a dry dropsie through his flesh did flow*

*Which by misdiet daily greater grew.*

*Dropsie* is the accumulation of water in the tissues, *dry dropsie* is the deposition of fat.

*And next to him rose lustfull Lechery* riding on a goat:

*Lewdnesse fild him with reprochfull paine*

*Of that fowle evill which all men reprove*

*That rots the marrow, and consumes the braine:*

The *fowle evill* referred to here is certainly tertiary syphilis, and for the late sixteenth century a good and concise description of the disease follows. Late stage syphilis certainly destroys bone marrow and attacks the central nervous system.

Greedy *Avarice* sat behind him on a camel laden with treasure, though the rider was thin and his clothes threadbare:

*A vile disease; and eke in foote and hand*

---

<sup>a</sup> lifeless

<sup>b</sup> bad living

<sup>i</sup> livid

*A grievous goute tormented him full sore.*

Gout is an exquisitely painful disease and as Spenser avers affects the smaller joints, such as the *foote and hand*.

The *fifte in rowe* was malicious *Envy* riding on a *ravenous wolfe* with a *venemous tode* (toad) in between his *cankred teeth* and a poisonous snake hidden under his clothes.

His only malady was leprosy. Beside him on an uncontrollable lion *rides fierce revenging Wrath*; in his berserk rages, he keeps cutting himself and his clothes which are *staind with blood*. Spenser tells us he has more than one sin-attributable disease.

*....fretting Griefe, the enemy of life*

*.....and many evils moe haunt Ire,*

*The swelling Splene, and Frenzy raging rife,*

*The shaking Palsey, and St. Fraunce's fire:*

*Such one was Wrath the last of this ungodly tire.*

*fretting Griefe* might well be suicidal manic depressive psychosis which is surely *the enemy of life*. Anger was supposed to emanate from the spleen and a *swelling Splene* was clearly as a result of the failure to filter off the choler. *Frenzy* from *phrenesy* from *phrenitis* was an acute rather than chronic disease marked by excitability, delirium and fever. The *shaking palsy* immediately brings Parkinson's disease to mind, but the preceding lines tell of seizures of violent anger which later are repented and over which he has no control:

*His .... raiment all was stained with blood*

*Which he had spilt ....*

*For of his hands he had no government*

*Ne car'd for blood in his avengement:*

*But when the furious fit was overpast*

*His cruell facts (deeds) he often would repent.*

The *shaking Palsey* could therefore represent temporal lobe epilepsy - a type of fit in

which there is no control and often no recollection, but if there is, it is often accompanied by remorse. This in fact is more likely to fit Spenser's description than Parkinson's disease which is a non violent disease associated mainly with senility. *St. Fraunces fire* is very interesting and is probably erisypelas, an infection of the skin associated with burning pain and fever.

It was stated above (section IV.2) that a scientific study of 158 cases of disease in Post Crusade Europe, 12% were believed at the time to be attributable to sin. It was, however, opined by the writers that literists might be likely to use divine retribution as a "device". In this section, relating to the Deadly Sins, it is more likely that the examples quoted by Spenser are indeed literary devices. It is not suggested that the specific diseases above necessarily fit their sin (with the one very definite exception of Syphilis which is directly related to lechery), but nonetheless these examples underline the belief that some illness was seen as punishment for transgression, and it will be shown in the following section that the will of God was still thought to be the principal factor of pathogenesis. Thus, although the fanciful relationships between, for example, gout and avarice, is a literary device, the basic premise that contemporary poetry reflects trends in medical ideas is supported by the verses in this section and although Edmund Spenser would certainly be aware of Galenic and Hippocratic concepts, his description of the *Queen of Eville's* coach would be pallid and insipid had he not seized on the vivid and compelling imageries of disease as nemesis for the seven deadly sins. Leprosy in particular was believed to be punishment for sin, crime and depravity, especially sexual.<sup>12</sup> Lepers were also believed to have insatiable sexuality.<sup>13</sup> *Cresseid's* leprosy as a result of her *wanton blude* was mentioned above. Hoccleve also gave a poetical reference in the tale of *Jereslaus' wife* when the lecherous conspirators are all struck down with diseases and the worst of them becomes a *foul lepre*.<sup>14</sup>

#### IV. 4. THE FOUR ROOTES OF THE PESTYLENCE

Dr Thomas Phaer (1510-1562), sometimes called the "Father of English Paediatrics" was a physician and author of medical textbooks.<sup>15</sup> His best known medical work, which is acknowledged as the first English book on paediatrics is the *Boke of Chyldren*. He wrote other medical textbooks including one on Phlebotomy (which unlike some "leechbooks" is not written in verse). He also wrote *A Goodly Bryefe Treatise of the Pestylence* in the second half of the 16th century *with the Causes, Signes and Cures of the Same*. He cites *the four rootes or causes* of the plague:

*the first roote and superior cause is God's will; The Second roote of the pestilence doth depende of the heavenly constellations (vide supra III.2); ...The third roote or cause beeinge inferiour, is the stinche and filthy savors that corrupt the air.*

This is a very clear depiction of miasma. His *fourth roote* is

*the abuse of things not natural, that is to wit, of meate, and drinke, of slepe and watching, of labour and ease, of fulnes and emptynes, of the passions, of the minde, and of the immoderate use of lychery.*

His so-called *inferiour rootes* are Galen's *sex res non naturales* (vide supra IV.1)

The *superiour* and therefore more important causes are still thought to be God's will and astrology, and the so-called *non-natural* causes (which in fact were natural) are held to be secondary. This persistence of supernatural beliefs was a superstition which lingered in people's minds, and would certainly be seized upon by poets for lyrical effect.

Hoeniger cites three main causes for the conviction that *certain diseases, especially epidemics* were due to supernatural influence: in addition to the enduring appeal of traditional views, he adds *the influence of the Bible*.<sup>16</sup> He also suggests the inadequate

scientific understanding of the causes of epidemics and other diseases. The *Hippocratic Corpus* included a treatise, *On Airs, Waters, Places and Epidemics*<sup>17</sup> and this pointed out the great importance of environment to the fundamental humoral balance. The concept of *miasmata* was introduced to explain poisoning or pollution of the air. It certainly survived for many years and even in a 1878 Medical Dictionary *miasma* is defined as

*a volatile, deleterious principle arising from the bodies of the sick and then regarded as the contagious effluvium of disease; or from decaying animal or vegetable substances; or from certain portions of the earth and then referred to malaria, marsh-gas &c.*<sup>18</sup>

Swarms of insects, bad smells and toxic gases from marshes were thought to infect the air itself. It was not known, however, how bad air or miasma transmitted disease. Analogies to dyeing cloth, an apple going rotten, or the growth of fire from an initial spark were put forward. Miasma remained in the second line of causes, along with astrological conjunctions and the non naturals.

Shakespeare was well aware of the Hippocratic idea that miasma or poisoned or polluted air caused epidemics. He gives us quite a few examples. In *Richard II*, (1596), we hear of a

*Devouring pestilence hangs in our air.*<sup>19</sup>

Shakespeare reiterates the concept when *Orsino* praises his love at the very beginning of *Twelfth Night* (1600) thus:

*O, when mine eyes did see Olivia first  
Methought she purged the air of pestilence.*<sup>20</sup>

In *Timon of Athens*, (1608) Shakespeare combines miasma, divine retribution and astrology:

*Be as a planetary plague, when Jove  
Will o'er some high-vic'd city hang his poison*

*In the sick air:*<sup>21</sup>

Once again poison is hung in the air, but here *Jove* has brought that miasma to a city high in vice as a punishment for their transgressions. In *A Winter's Tale*, (1611) the King of Sicily tells his son how safe he will be during his stay:

*The blessed gods*

*Purge all infection from our air whilst you*

*Do climate here.*<sup>22</sup>

Interestingly, here the term *infection* is used: it is however quite definitely a function of the air and implies once more, miasma.

Shakespeare also expresses the prevalent belief that miasma was thought to be worse in the damp night air. The sun's rays were thought to have a sterilizing effect on the air, which is interesting because ultra-violet light can destroy the cell walls of certain bacteria, but this of course was unknown during the Bard's lifetime. In *Julius Caesar*, *Brutus'* wife tries to prevent her husband inhaling the miasma of the night:

*Is Brutus sick, and is it physical<sup>j</sup>*

*To walk unbraced<sup>k</sup> and suck up the humours*

*Of the dank morning? What, is Brutus sick,*

*And will he steal out of his wholesome bed,*

*To dare the vile contagion of the night,*

*And tempt the rheumy<sup>l</sup> and unpurg'd air*

*To add unto his sickness?*<sup>23</sup>

Shakespeare further alludes to the dangers of breathing the infected air of the night in *The Rape of Lucrece*:

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<sup>j</sup> Here *physical* means *healthy*.

<sup>k</sup> *unbraced* means *unguarded*.

<sup>l</sup> *rheumy* means *misty*

*Oh hateful, vaporous and foggy night!*

*With rotten damps ravish the morning air;<sup>24</sup>*

*Timon* too alludes to the miasmata in the early morning mists, and alludes to the effect of the sun's rays:

*O blessed breeding sun, draw from the earth*

*Rotten humidity; below thy sister's orb*

*Infect the air!<sup>25</sup>*

Here *thy sister's orb* refers to the sun's "sister", the moon. This is a reference to the concept of corruptibility in the sublunary sphere. *Coriolanus* (1608) rebukes his soldiers when they have retreated to the trenches thus:

*All the contagion of the south light upon you*

*You shames of Rome! you herd of - Boils and plagues*

*Plaster you o'er that you may be abhorr'd*

*Farther than seen, and one infect the other*

*Against the wind a mile.<sup>26</sup>*

It is clear from this that poisonous air was perceived as a vehicle of infection.

Christopher Marlowe refers to *contagious smells* in *Tamburlaine* (1590): *Olympia* is frantically but vainly seeking a means of suicide but finds

*....no herbs whose taste may poison thee*

*Nor yet this air beat often with thy sighs*

*Contagious smells and vapours to infect thee.<sup>27</sup>*

In the *Tragedy of Locrine*, Marlowe tells us also how dead bodies *infect the air with their carcasses.<sup>28</sup>*

It was also thought that a person's breath could similarly be infectious. Webster (1580 - 1625) gives us a reference to this:

*O your breath:*

*Out upon sweetmeats and continued physic -*



*The plague is in them.*<sup>29</sup>

Ben Jonson clearly was aware that the plague could be caught by air-borne droplet infection on the breath. In the *Alchemist* (1610), *Lovewit*, the Master is fearful that he might catch the plague by *Face* the housekeeper breathing on him. After *Face* tells him the house has been visited with the plague, *Lovewit* enjoins *Face* to *Breathe less and farther off*.<sup>30</sup> Shakespeare gives us many references to breath being infectious. In one of *Timon's* rants about infecting the Athenians, he says:

*Breath infect breath,*<sup>31</sup>

In *King John*, the wounded *Melun* mixes a metaphor with miasma-laden night air and infectious breath:

*But even this night, whose black contagious breath.*<sup>32</sup>

Donne too in 1601, implied that contagion in leprosy was transmitted via breath. He says,

*By thee the seely Amorous sucks his death*

*By drawing in a leprous harlot's breath.*<sup>33</sup>

The concept persisted long after the period under study until the discoveries of the bacteriologists in the 19th century. Shakespeare gives many allusions to it, telling how *pestilence hangs in our air* in four of his plays: he enlarges in three more plays with references to the even greater dangers of *hateful ... night air* and *dank morning air*. Together with Marlowe, he describes the air as a vehicle for infection. Webster, Ben Jonson and Donne join the Bard in giving us examples of the dangers inherent in breathing infected air (which would now be known as airborne droplet infection).

With respect to miasma and corrupted or polluted air, contemporary poets give us a good number of poetry references to a concept which was not only firmly entrenched in traditional medical orthodoxy but which was to persist for centuries. They clearly

support the premise that study of poetry demonstrates the spread of current medical beliefs among the laity.

#### IV. 5. THE POETICAL 'FATHER OF GERM MEDICINE' AND SYPHILUS

The terms *infection* and *contagion* are used almost interchangeably both by poets and by Galen and Hippocrates. Etymologically, contagion should really mean spread of disease by touch. In 1546 Hieronymus Fracastorius had published a remarkable prose passage *de Contagionis et Contagiosis Morbis*<sup>34</sup> in which he described a germ theory without the benefit of a microscope and some 300 years before its empirical formulation by Pasteur and Koch. Garrison (1929) has described Fracastorius treatise as *wonderful clairvoyance*<sup>35</sup> but Charles and Dorothea Singer (1917) in a very thorough discussion of Fracastorius' sources and influence,<sup>36</sup> together with Howard-Jones (1977) are not quite as complimentary, saying that he was only re-stating what had been already postulated by Galen and that his contribution to the Scientific Revolution demands reappraisal.<sup>37</sup> Fracastorius never actually claimed to have originated the theory, but by the same token he never gave any attribution to his predecessors whose works he almost certainly knew. Galen's mention of the "seeds of pestilence"<sup>38</sup> had certainly not been particularly well-known and Fracastorius crystallized and re-stated the ideas at a time when many new medical concepts were being proposed. Perhaps in his defence, it may be pointed out that he was not a professor at a University but a scholarly local physician, more famous for his elegant Latin verse after the style of Virgil.<sup>39</sup>

Even before Galen, Anaxagoras (500-428 BC), as well as Theophrastus (372-287 BC) and Varro (116-27 BC) all mentioned invisible seeds of all things in the air.

Fracastorius went much further than merely postulating *seeds*. In *de Contagionis*, he stated that each epidemic disease is caused by a different type of rapidly multiplying minute body, and that these bodies are transferred from the infector to the infected in

three ways: direct contact, intermediate agents (fomites) and airborne infections. His quite remarkable theory must be viewed in the context of the time. Nutton considers *it to be an important contribution to a long and vigorous debate.... on the problem of causation*. He points out that Fracastorius was a Galenist and believed in the humours but that for him, contagion did not depend on the patients specific humoral balance, but on different seeds of contagion. Further he did not advocate treatment of communicable diseases as being specific to the individual and his complexion (e.g. different for phlegmatics than choleric). He thought that any specificity was for definite treatments directed against specific seeds of the disease. He believed that once the "seeds" had been destroyed, expelled or broken up that the disease would not progress further. To the Renaissance doctors, he had given a fresh outlook on infectious diseases, expanding the Galenic idea of seeds of pestilence and implying a new concept of specific disease entities caused by specific seeds and requiring precise treatments.

This ontological theory of communicable disease, required some hard evidence to back it up. Without the microscope it was not forthcoming. As Nutton says,

*even Fracastoro's forceful rhetoric and limpid exposition could not overcome the technological handicaps that any theory of seeds then faced. Better to treat the patient visible before the doctor and to avoid malodorous miasmata than to chase unprofitably after invisible and hypothetical seeds.*<sup>38</sup>

Because of the lack of evidence, Fracastorius' theory remained just that - a theory and it would seem that it had not become accepted in England to any extent by Shakespeare's time. Certainly he and other contemporary poets still used the words *contagion* and *infection* indiscriminately. They also tended to use the words in a poetic manner rather than medically.

Shakespeare uses the word *infection* 23 times ( as well as *infect* 22; *infected* 21;

*infects* 7; *infections* 1; *infecting* 1; *infectiously* 1; *infectious* 7)<sup>40</sup> but it is often metaphorical: *Prospero* says in the *Tempest*, *whom to call brother / Would infect my mouth*.<sup>41</sup> after spitting at the *Duke of Gloucester*, *Lady Anne* tells him, *Out of my sight, thou dost infect mine eyes*.<sup>42</sup> In *Henry IV, Part 2*, *Prince Hal* tells the dying king, *But if it did infect my blood with joy*.<sup>43</sup> Shakespeare also on occasion uses the word *infected* to mean *false or assumed* in a *Lover's Complaint*, the seducer's crocodile tears are referred to as *that infected moisture of his eye*.<sup>44</sup>

He also uses *contagion* as a metaphor: the word is used seven times in his works - in a medical sense five times and metaphorically only twice. In fact, if he is compared to contemporary poets, he uses the two words *contagion* and *infection* (and their inflexions) literally far more often than his peers: *Marvell* uses *contagion* three times and *infection* four times and all are fanciful allegories.<sup>45</sup> *John Milton* uses *contagion* five times and *infection* four times and he too uses the words exclusively as metaphors.<sup>46</sup> In *Lycidas* he refers to the corruption of the Roman Catholic clergy

*But swoln with wind and the rank mist they draw  
Rot inwardly and foul contagion spread*.<sup>47</sup>

*Ben Jonson* uses *contagion* only once and *infection* thrice. On one occasion only, when he refers to infectious leprosy does he use the words in their literal sense.<sup>48</sup> *George Herbert* (1593-1633) refers to *infection* three times and *contagion* once, and all in a flowery metaphorical sense.<sup>49</sup>

Despite the contribution to early germ theory of *Fracastorius* who has been called the "Father of Germ Medicine", it is very apparent from all the poets studied that his treatise *de Contagionis* was certainly not generally well known. *Fracastorius* had achieved popularity but his fame during this era rested more on his celebrated poem, *Syphilis, sive morbus Gallicus* (1546) which has been translated and reprinted many

times. It is, of course, from the principal figure of this epic poem, a promiscuous shepherd boy called *Syphilus* that we get the name for the venereal disease which had started to ravage Europe in the late fifteenth century.<sup>50</sup> Since Fracastorius was an Italian who wrote in Latin, it is beyond my remit to include the finer details of his verses in this thesis which is concerned with allusions to medicine in English poetry. Having said this, however, it would be negligent not to mention a poem which gave its name to a disease which became a scourge to the civilized world in the 1490's. Briefly, the most popular theory of the origin of syphilis in Europe was that it was imported by Columbus' sailors on their return from the New World. One of the reasons for Fracastorius calling the disease by a new name (syphilis) is thought to be *that a disease of universal prevalence due to a common and universal cause ought not to carry in its name a reproach on a single people.*<sup>51</sup>

#### IV. 6. THE GREAT POX IN POETRY

William Dunbar the Scottish poet (c 1460 - c 1515), who wrote in a similarly lively style to his forerunner Chaucer, calls it the *Spanje pockis*<sup>m</sup> Dunbar's poem tells of some of the effects of the disease and how men as strong as giants are brought down:

*Sum thocht theme selffis stark<sup>n</sup> lyk gyandis  
Are now maid waek<sup>o</sup> lyk willing wandis<sup>p</sup>  
With schinnis scharp and small lyk rockis  
And gotten thair back in bayth thair handis  
For ower oft muckle of the pockis.*<sup>52</sup>

The *schinnis scharp* refers to a characteristic sign of syphilis known as "sabre shins"

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<sup>m</sup> *Spanish Pox*

<sup>n</sup> *thought themselves strong*

<sup>o</sup> *weak*

<sup>p</sup> *wands that are easy to bend*

the shin bones become angular and sharp-edged like swords. The ability to get their back in both of their hands gives quite a vivid word-picture of these former strong men staggering, but also suggests they have lost weight to such an extent that they can span their own backs with their hands. Dunbar also suggests preventive measures:

*I saw cocklinkis<sup>a</sup> me besyd*

*The young men to thair howses gyd*

*Had bettir luggit<sup>r</sup> in the stockis*

*Some fra the bordell<sup>s</sup> wald not byd*

*Quhill<sup>t</sup> that thai gat the Spanje pockis*

and concludes one should

*Keip fra harlottis nycht and day.*

Shakespeare does not refer to Syphilis as the Spanish pox, but is far less partisan, calling it either the malady of France or the Neapolitan disease. In *King Henry V*, Pistol hears of the death of his partner:

*News have I that my Nell is dead i' th' spital,<sup>u</sup>*

*Of malady of France.<sup>53</sup>*

Shakespeare also calls it the Neapolitan Disease: *Thersites* says,

*After this, the vengeance on the whole camp/ or rather the Neapolitan bone-  
achel for that methinks is the curse depending on those that war for a  
placket.<sup>54</sup>*

The word *placket* is interesting here: it is meant to allude to the female genitals (a placket was an opening in a skirt or petticoat). In *King Lear*, *Edgar* says *Keep thy foot out of brothels, thy hand out of plackets.<sup>55</sup>* Shakespeare gives us three references to

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<sup>a</sup> prostitutes

<sup>r</sup> languish

<sup>s</sup> brothel cf. bordello

<sup>t</sup> while

<sup>u</sup> hospital

*the malady of France*<sup>56</sup> two to the disease of Naples,<sup>57</sup> and eleven to *French crowns*.<sup>58</sup> This last is alluding to the syphilitic tubercles which occurred as a manifestation of secondary syphilis; they occurred on the forehead and temple area and behind the ears and so, to the fanciful, could be seen to be in the distribution of a crown.

It is quite clear that Shakespeare and his public knew that syphilis was a contagious venereal disease. Shakespeare implies that it was known that a primary syphilitic chancre could be caught by kissing:

**TIMON:**        *This fell whore of thine  
                     Hath in her more destruction than thy sword*

.....

**PHRYNIA:**    *Thy lips rot off!*

**TIMON:**        *I will not kiss thee; then the rot returns  
                     to thine own lips again.*<sup>59</sup>

*Timon* later urges the two whores to:

<i>Consumptions sow</i>	150
<i>In hollow bones of man; strike their sharp shins,</i>	
<i>And mar men's spurring. Crack the lawyer's voice,</i>	
<i>That he may never more false title plead,</i>	
<i>Nor sound his quillets shrilly. Hoar the flamen,<sup>v</sup></i>	
<i>That scolds against the quality of flesh</i>	155
<i>And not believes himself. Down with the nose,</i>	
<i>Down with it flat, take the bridge quite away</i>	
<i>Of him that, his particular to foresee,</i>	
<i>Smells from the general weal. Make curl'd-pate ruffians bald,</i>	

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<sup>v</sup> a *flamen* is a priest and *hoar* means to cover in white blotches (cf. hoar frost): hence *cover the priest with white blotches*.

*And let the unscarr'd braggarts of the war*

160

*Derive some pain from you. Plague all,*

*That your activity may defeat and quell*

*The source of all erection. There's more gold.*

*Do you damn others, and let this damn you,*

*And ditches grave you all!*

165

The sabre *shins* in line 151 were mentioned in Dunbar's poem above: Syphilis gives sore heel bones and so would *mar... spurring* (line 152) Syphilitic laryngeal ulceration would certainly *crack the lawyers voice* (*quilllets* are subtleties cf. quibbles). A cleric is chosen as the victim of the white scaly skin eruption (line 154); there is a syphilitic skin lesion (psoriatic syphilide) which would fit the bill nicely here. *Down with the nose* (line 156) alludes to destruction of the bridge of the nose as a result of the collapsing of diseased bone in the septum of the nasal cavity to give what is still known as a "saddle nose". After the central bone of the nose has collapsed, foul-smelling crusts and creamy coloured pus cause a very unpleasant smell: this condition is called syphilitic ozaena, and is what is referred to in line 159 *smells from the general weal*. The baldness is an allusion to the French crown, and the lines 162-163 refer to syphilitic impotence.

This excellent graphic clinical word picture of tertiary (i.e. late) stage syphilis is remarkable in its thoroughness. It is a great tribute to Shakespeare's medical knowledge because Bucknill writing in 1860 records that some of the symptoms mentioned in the passage were scarcely recorded even in contemporary medical texts.<sup>60</sup> Shakespeare makes reference to the syphilitic saddle nose deformity and its associated nasal voice in *Othello*: a clown asks some musicians,

*Why masters, ha' your instruments been in Naples,*

*that they speak i' the nose thus?*<sup>61</sup>

Shakespeare uses the word *instrument* elsewhere as a *double entendre* for penis;<sup>62</sup>



Naples is, of course, an allusion to the malady of Naples. Shakespeare refers to the skin lesions elsewhere in *Timon*. *Timon* rants at the Lords, *the infinite malady, crust you quite oer*<sup>63</sup> and in the following Act, the demented *Timon*, who seems to be obsessed by this disease, refers us to:

*She whom the spital-house and ulcerous sores  
Would cast the gorge<sup>w</sup> at....*<sup>64</sup>

In *As You Like It* (1600), more allusion is made to syphilitic skin disease. The *Duke* refers to ulcers and sores when he indicts *Jaques*:

*And all th' embossed sores and headed evils  
That thou with license of free<sup>x</sup> foot has caught.*<sup>65</sup>

Sir John Davies also refers to the saddle nose of syphilis in two of his *Epigrammes*; they are both dedicated to whores and the first one tells us of *Gella*:

*If Gellas beautie be examined  
She hath a dull dead eye, a saddle nose.*<sup>66</sup>

The reference to the *dull dead eye* might well mean that Davies is referring to the congenital form of the disease which has the saddle nose and also an eye disease in which the front of the cornea becomes cloudy (interstitial keratitis). Davies tells us of another whore called *Flora*,

*Who saith that Flora hath the French disease.....  
I now perceive when this suspicion growes  
Forsooth she speakes a little through her nose.*<sup>67</sup>

Here it is suggested that listening to a harlot's voice may be a guide to their syphilitic status.

This section on Syphilis clearly demonstrates that a study of contemporary poetry

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<sup>w</sup> gorge, throat cf. "my gorge rises"

<sup>x</sup> license of free foot here means licentiousness.

gives much information on the impact which the disease had and the knowledge amongst the laity of the signs and symptoms of the malady. Dunbar's poetry paints a colourful picture of the debilitating nature of the illness and adds a preventive health warning to *keip fra harlottis nycht and day*. Shakespeare's comprehensive description is said to be as complete as any of the medical books of the time. Edmund Spenser's summary of tertiary syphilis is succinct and graphic. Davies mentions the eye lesions of the disease and, like Shakespeare describes the saddle nose and its effect on the voice. In keeping with the bawdiness of the age, the poets, far from displaying any prurience in dealing with a sexual subject, tend to overemphasize the ribaldry, which would doubtless be appreciated by their audience. Nonetheless there is a wealth of clinical description above, particularly from William Shakespeare and examination of this poetry shows how much medical knowledge was disseminated to the laity.

#### IV. 7. A LIFETIME OF MERCURY FOR ONE MOMENT OF VENUS

The usual treatment of Syphilis at the time was fumigation with cinnabar, an ore of mercury, in either a 'sweating house' or a 'tub', which from contemporary prints, looked like a Turkish bath. (Mercurial fumigation had been used since the twelfth century for treating leprosy). It is Shakespeare's *Timon* once again who gives us some references to this. In one of his harangues of the prostitute, *Timandra*, he pleads with her to

*Season the slaves*

*For tubs and baths; bring down rose-cheek'd youth*

*To the tub-fast and the diet.<sup>68</sup>*

*Tub-fast* is the sweating fumigation treatment. In *Measure for Measure* (1605), further reference is made to this

LUCIO: *How doth my dear morsel, thy mistress?*

*Procures she still, ha?*

POMPEY: *Troth, sir, she hath eaten up all her beef, and she is herself in*

*the tub.*<sup>69</sup>

The tub is described by the noted 16th century surgeon Ambroise Paré (1510 - 90) thus:

*They put the patient under a tent or canopy made close on every side,  
and they put 'him onto a vessel with hot coals, whereon they plentifully  
throw cinnabaris...*<sup>70</sup>

The treatment for syphilis is catalogued by contemporary poets. Mercurial fumigation remained the mainstay and Shakespeare gives us a few references to it. He also tells of the dietary regimen.

#### IV. 8. A LESSER POX

After his comprehensive discussion of the Great Pox; it is perhaps a great surprise that Shakespeare gives us no obvious reference to the Small Pox, which according to the *History of Epidemics in Britain* was rising in prominence in this country at the end of the Elizabethan period and in the first years of the Stuarts.<sup>71</sup> Other English poets of the Period do mention it. Probably the first poem to allude to it is by Thomas Spillman in 1602, *Upon His Ladies Sickenesse of the Smalle Pockes*, in which he addresses the disease,

*Cruell and unpartiall Sickenesse,*

.....

*Are not these thy steps I tracke,*

*In the pure snow of thy face,*<sup>72</sup>

Ben Jonson wrote *An Epigram to the Small Poxe* in 1616 (the year of Shakespeare's death). He calls the disease,

*Envious and foule Disease, could there not be*

*One beautie in an Age, and free from thee.*<sup>73</sup>

Both poets firstly give the strong impression that there is a prevalent epidemic, but both then go on to say that the beautiful women affected by the disease survive, but with the terrible scars. Lady Haddington, however, died from smallpox as we hear from Bishop Robert Corbett (1582-1635) whose own wife died from the disease. He writes vividly of the scarring of beauty on lovely women's flesh:

*Oh thou deform'd unwoemanlike Disease,  
That plowst up flesh and bloud, there sow'st pease,  
And leave such printes on Beautie, that dost come,  
As clouted shon do on a floore of lome;  
Thou that of faces, hony-combes dost make,  
And of two breasts two cullenders.<sup>74</sup>*

The fourth line of this quotation likens pockmarks to the footprints left by *clouted shon* (clogs with studs) on a raked earth floor.

John Dryden's school fellow, Lord Hastings, died of smallpox aged nineteen, and what might well be Dryden's worst lines of verse recall his death.

*Blisters with pride swell'd; which th'row's flesh did sprout  
Like Rose-buds, stuck i' th' Lily-skin about.  
Each little Pimple had a Tear in it.  
To wail the fault its rising did commit.<sup>75</sup>*

In these contemporaneous poems on Smallpox, an exceptionally contagious disease, no reference is made to the "seeds of contagion" mentioned by Fracastorius. Indeed, all imply, though do not state, a supernatural rather than a natural cause: there is a definite inference that the transmission is either by pure chance (*impartiall*), or that the disease was so widespread that it was inevitable. Spillman and Jonson ask, rhetorically, what did their lady love do to deserve a visitation from the personified disease; Dryden too, does not mention any form of infection but wonders why *Must Noble Hastings Immaturely die*. He states the disease cannot possibly be a punishment

for sin:

*Is Death (Sin's wages) Grace's now?*

He implies the cause is not in the stars:

*Come learned Ptolemy, and trial make,*

*If thou this Hero's altitude canst take;*

*But that transcends thy skill; thrice happie all*

*Could we but prove thus Astronomical ?<sup>76</sup>*

A study of poetical references to the Smallpox epidemic all written in the first half of the 17th century certainly reflects a change in the contemporary ideas about the causes of disease. The idea of Divine punishment for sin, so beautifully allegorized by Edmund Spenser in the *Faery Queen* has gone. Indeed Dryden and Bishop Corbett almost suggest the reverse! Gone too are the astrological causes of smallpox, at least for Dryden, who invokes Ptolemy only to denounce causes *astronomical*. There is, however, no reference, either tacit or direct to any form of germ theory. Fracastorius was already part of the lay culture of medicine and his famous Latin poetical work, *Syphilis sive Morbus Gallicus* had been very popular in England during the Elizabethan era, and was reprinted at least twenty-five times in the sixteenth and seventeenth centuries.<sup>77</sup> It would seem that his pains to update and improve the Galenic "seeds of pestilence" theory of contagion and to introduce an ontological germ theory, more thoroughly expounded in his later prose work, *de Contagionis* had not been accepted in England one hundred years later. It has been suggested that this might well have been owing to the lack of evidence to support the theory.<sup>78</sup>

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<sup>77</sup> for full bibliography see WYNNE-FINCH, H. (1935).<sup>77</sup>

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## CHAPTER V

### ON THE CIRCULATION OF BLOOD

*Know'st thou how blood, which to the heart doth flow*

*Doth from one ventricle to th' other goe?*<sup>1</sup>

John DONNE (1612)

#### **V. 1. THREE SOVEREIGN THRONES**

Plato had considered the three principle organs of the body to be the heart, the brain and the liver. In *Twelfth Night*, (1601) Shakespeare refers to ..... *liver, brain and heart, these sovereign thrones* ... Three souls had their seats in the three organs named above.<sup>2</sup> The *nutritive* or *vegetable* soul (that soul which man has in common with both plants and animals, since both of these also grow) resides in the liver. The *sensory* soul (which we have in common with animals, since man and animals are able to feel pain) has its seat in the heart; the *rational* soul, which is peculiar to man alone, is immortal and linked to the cosmos (thus strengthening belief in astrology) is located in the brain.

Aristotle considered the heart to be the centre of the body, both in its anatomical position and also with regard to its importance. Edmund Spenser in a Sonnet asks,

*Is not the hart of all the body chiefe*

*And rules the members as itself doth please?*<sup>3</sup>

Aristotle believed (wrongly) like his predecessor, Hippocrates, that the nervous system arose from the heart, and surely this is where the idea developed that the heart is the centre of feeling. Two Alexandrian physicians, Herophilus and Erasistratus (3rd Century BC) enlarged and improved the Hippocratic Corpus and posited that the brain was the seat of thought (as well as the rational soul) Galen of Pergamon, however, who exerted the most important classical influence on medicine during mediaeval times, although usually an ardent follower of Aristotelian theory, disagreed with his

mentor on the primacy of the heart: How, he argued, could one otherwise explain how a heavy blow to the skull could render a person senseless?<sup>4</sup> The controversy about the various locations of the soul is brought out in Sir John Davies' humorous poem "*Nosce Te Ipsum*" (1599):

*And thus they vary in judgement of her seat,  
For some her chair up to the brain do carry;  
Some thrust it down into the stomachs heat!  
Some place it in the root of life, the heart;  
Some in the liver, fountain of the veins;  
Some say, she is all in all, and all in part,  
Some say, she is not contained, but all contains.*<sup>5</sup>

Davies at the end of the sixteenth Century uses a nice summary here: he points out the three Platonic seats of the soul (*chairs*) but in the last couplet fleetingly alludes to the rival Aristotelian monist concept which holds that the rational soul has no similar seat in the body but is all pervasive. He shows that the popular view of the soul or souls was uncertain; although there was a series of concepts to choose from.

## V. 2. THE PNEUMATA

In Galenic physiology, the nature of blood appears somewhat confused. It was known that venous blood was a much darker colour than that in the arteries, and it was thought quite reasonably that the types of blood contained in each were in some way different. It was thought that in addition to the humoral blood, the blood vessels also contained three essential spirits or *pneumata*. They were essential to life and originated in the *three Sovereign thrones* referred to above. Galen perceived the blood vessels principally as vehicles for these spirits.<sup>6</sup>

The nutritive soul in the liver produced *natural spirit*, which was thought to be present

in all living things, animal or vegetable, and so was taken in with food. From the gut it found its way to the liver where it was purified or *concocted* into blood proper. Blood was thought to be made by the liver, and since all veins were believed to originate from there, so venous blood was said to be rich in this natural spirit.

TABLE TO SHOW PNEUMATA

	Origin	Habitat	Function	Source	Dominion
Natural Spirit (Natural pneuma)	Liver (nutritive soul)	Veins	Nutrition	Food (plants and vegetables)	Jupiter
Vital Spirit (vital pneuma)	Heart (Sensory soul)	Arteries	Passions Feelings	Air (World Spirit)	Sun
Animal Spirit (psychic pneuma)	Brain rete mirabile (rational soul)	Nerves	Reasoning Thought Judge- ment	Refined Vital Spirit	Mercury

The *vital spirit* was another type of spirit which was breathed into the body with the air via the lungs to reach the left side of the heart where it was concocted with the arterial blood by the sensory soul. The arteries were initially thought to contain principally air and indeed *arteria* is Greek for "carrier of air". The arteries functioned to transport the smaller amount of spirituous blood with its vital spirit. Marlowe refers to this vital (*lively*) spirit towards the end of *Tamburlaine*:

*Your arteirs which amongst the veins convey*

*The lively spirits which the heart engenders,*<sup>7</sup>

A third spirit known as the *animal spirit* or *pneuma psychicon* was concocted in the rete mirabile, a network of fine veins found at the base of the brain in many mammals but not man (and since Galen had only dissected animals, he was unaware of this major flaw in his theory) which was exposed by Vesalius in 1543. The animal spirit was thought to be the motive spirit present in nervous tissue.

### V. 3. GALEN'S MICROPORES

Since blood was formed by the liver, but some found its way into the arteries, there had to be a route for the venous blood to reach the arterial tree. Galen's explanation of how the blood passed from the right side of the heart (veins) to the left (arteries) was by imaginary *micropores* in the interventricular septum of the heart, invisible to the

naked eye.<sup>8</sup> Vesalius in 1543 could not find these pores but did not fully deny their existence, saying that *We are greatly forced to wonder at the skill<sup>9</sup> of the Great Artificer of all things by which the blood sweats through passages which are invisible to sight.*<sup>9</sup> Donne is obviously aware of this physiological problem and asks in the *Second Anniversary*,

*Know'st thou how blood, which to the heart doth flow  
Doth from one ventricle to th' other goe?*<sup>10</sup>

Phineas Fletcher also refers to these micropores :

*The grosser waves of these life-streams...  
As through a wall, with hidden passage slide;  
Where many secret gates (gates hardly spi'd)  
With safe convoy give passage to the other side.*<sup>11</sup>

Fletcher tells us in a margin note that the septum *at first .. seems thick, but if it be well viewed, we shall see it full of many pores, or passages.*

#### V. 4. EMPEDOCLES' TIDAL FLOW

Clearly, long before Harvey's discovery of the circulation, it was known that blood flowed in the blood vessels. The pre-Socratic philosopher, Empedocles (492 - 432 B.C.) had suggested, *the heart is nourished in a sea of blood which courses in two opposite directions.*<sup>12</sup> This is a correspondence resulting from the universal analogy.

The sea, and the ebb and flow of the tide in the geocosm was thought by Empedocles to be mirrored in the tidal flow of the blood in the microcosm (man) and it was thought that the blood in the blood vessels flowed to the periphery, not by a pumping action of the heart, but that rather it was pulled or attracted there a manner similar to the tides. This view which was prevalent in the 15th and 16th Centuries is often thought to be

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<sup>8</sup> The word in the original Latin is *industriam*, here *skill* is taken from Whitteridge's translation. The more usual meanings of *industriam*, however, are *diligence*, *activity*, *assiduity* or even *industry*.

Galenic.<sup>13-16</sup> Hoeniger (1992) strongly challenges the association of Galen's name with this Empedoclean theory. He says,

*the basic physiological notion which has been attributed to Galen by several medical historians - namely that the blood in the veins washes back and forth, that it ebbs and flows - rests on no reliable evidence, and as it has found its way into editorial commentaries on Shakespearian passages, needs rectification.*<sup>17</sup>

May too, points out that Galen did not describe a to-and-fro system. In her direct translation of *de Usu Partium*, she emphasizes the same point in her footnotes. It would appear in fact that Galen had firmly refuted a shuttlewise ebbing and flowing in this work. Galen has been so often misinterpreted on this concept, it is worth noting his precise words on the matter. In May's translation of *De Usu Partium*. Galen is quoted:

*To no good purpose the blood itself could move incessantly in a sort of double course, flowing out during the expansion of the lung and filling all the veins there, and when the lung has contracted, moving like an ebb tide in the manner of a tidal strait, forever changing, back and forth, a motion in no way suitable for the blood.*<sup>18</sup>

Hoeniger adds, *the only place in the body where Galen does allow for a flow in opposite directions is the portal vein which connects the upper intestine to the liver.*<sup>19</sup>

Whittridge enlarges the point, saying that Galen had said that each part attracted sufficient requirements of natural and vital spirits inherent in the venous and arterial blood *as the fields use up supplies of rain* and that fresh supplies of this sufficiency were continually brought from the liver and heart. She adds that,

*other writers seem to have envisaged this as a continuous movement of ebb and flow in the veins, the blood returning to the liver for fresh supplies of natural spirit as this was used up by the parts.*<sup>20</sup>

In the same way as the blood is corresponded with the sea, the veins are often thought to be analogous to rivers. The four main blood vessels issuing from the heart, namely the aorta, the vena cava, the pulmonary artery and the pulmonary vein were compared by Cesalpino (1605) to the four rivers which flow out of Paradise. The Welsh physician-poet, Henry Vaughan refers to his beloved River Usk in anatomical terms in his pastoral poem, *Daphnis*:

*To where the swift Isca<sup>b</sup> from our lofty hills  
With loud farewells descends and foaming fills  
A wider channel, like som great port vein  
With large rich streams to feed the humble plain.<sup>21</sup>*

Not only does Vaughan here compare the Usk to the portal vein but he also alludes to the Galenic concept of blood being "soaked-up" by the peripheral tissues in the same way that water soaks into the earth.

Phineas Fletcher found little difficulty in using this analogy. In *The Purple Island* he too refers to the Rivers. His description of the portal vein below is worth quoting in full as he goes on to describe the valves in the vein (which of course prevent blood flowing backwards). Fletcher gives copious notes of explanation and tells us:

*(Note u) In the heart are foure great vessels: the first is the hollow vein  
bringing in the blood from the liver; at whose mouth stand three little folding  
doores, with three forks giving passage but no return to the blood.<sup>22</sup>*

This reference to the venous valve which *strongly* prevents any venous backflow shows that Fletcher was a well-informed Galenist and did not believe in the shuttlewise ebb and flow theory of Empedocles and others.

Shakespeare refers to blood flow on a number of occasions. *Brutus* tells *Portia*,

*You are my true and honourable wife*

---

<sup>b</sup> *River Usk* (not to be confused with Exeter, whose latin name is also *Isca*).



*As dear to me as are the ruddy drops*

*That visit my sad heart.*<sup>23</sup>

and this is quoted more than once to be a definite reference to the circulation of the blood!<sup>24</sup> He mentions blood flow *elsewhere: Measure for Measure* says:

*Lord Angelo ...*

*.....scarce confesses*

*That his blood flows,*<sup>25</sup>

*Friar Lawrence* tells *Romeo*

*..... through all thy veins shall run*

*A cold and drowsy humour;*<sup>26</sup>

In *Coriolanus* he uses the correspondence to rivers and tells of the *rivers of your blood* which flow *even to the court, the heart.*<sup>27</sup> In *Hamlet*, the poison poured into *Hamlet's* father's ear reaches the bloodstream and then *swift as quicksilver, it courses through the actual gates and alleys of the body.*<sup>28</sup> In *King John*, *Loves's Labour's Lost* and *King Henry IV*, however, we are left in no doubt whatsoever that far from being Harveian, the bard's physiology is in fact Empedoclean. *Berowne* tells us of

*... universal plodding*

*..... in the arteries.*<sup>29</sup>

*King John*, himself refers to the blood in the veins; flowing in an Empedoclean manner:

*Had bak'd thy blood .....*

*Which else runs tickling up and down the veins.*<sup>30</sup>

Shakespeare actually refers to a tidal flow as such, when *Prince Hal* becomes *King Henry V* and renounces his misspent youth, when he refers to his accession by alluding to pre-Galenic haemodynamic theory:

*.... The tide of blood in me*

*Hath proudly flow'd in vanity till now.*

*Now doth it turn and ebb back to the sea.*<sup>31</sup>

## V. 5. ARISTOTLE'S "CIRCULATION"

The word *circulation* had been used with respect to Galenic physiology, but had nothing whatsoever to do with the true Harveian circulation theory. In addition to this, there are two other confusing issues. Whitteridge refers to Aristotle's *adumbration of circulation* :<sup>32</sup> this is an analogy between the blood being soaked up by the peripheral tissues in the same way that the rain which falls on the Earth is soaked up by the fields. Harvey himself tells us of it in *de Motu Cordis*, (1628) when he compares the circulation of the blood to the circular motion of the planets and also to the "circular" motion of rain,

*Which motion we may call circular, after that same manner that Aristotle sayes that the rain and air do imitate the motion of the superior bodies. For the earth being wet, evaporates by the heat of the Sun, and the vapours being rais'd aloft are condens'd and descend in show'rs and wet the ground.*<sup>33</sup>

It is worth pausing here to note that even Harvey uses the cosmic analogy of Aristotle to illustrate his point. He goes on to explain, however, in the next paragraph that he chooses this particular metaphor because of his (Harvey's) acceptance of Aristotle's opinion of the primacy of the heart! Harvey gives other archaic analogies which are discussed later.

This cyclical movement from sea to clouds to rain to rivers to sea was perhaps an instance to the 17th Century mind of God's providential ordering of the universe so that nothing is wasted. Sylvester in 1605 alludes to it clearly in *Divine Works*:

*The purest humour in the Sea, the Sun  
Exhales in the Air, which there resolved, anon  
Returns to water; and descends again  
By sundry ways unto his mother Main.*<sup>34</sup>

The physician/poet Vaughan in the *Waterfall* (1651) tells somewhat more unbelievably

of every drop of water in a waterfall he is watching as having fallen over that waterfall before!

*.... each drop of thy quick store*

*Runs thither, whence it flowed before.*<sup>35</sup>

Henry Vaughan refers again to this rain-cycle in a translation from Latin of Boethius (A.D. 470/475 - 524). Vaughan translates:

*As blood let out forsakes the heart*

*And perisheth; but what returns*

*With fresh and brighter spirit burns.*<sup>36</sup>

Martin (1957) suggests that *probably Vaughan is thinking here of Harvey's work on the circulation.*<sup>37</sup> It is more likely that he is considering the rain-cycle, which Boethius would also have known about. These few lines, in fact, are a very good rebuttal of the Empedoclean ebb-and-flow: after forsaking the heart, the blood does not trickle back - it *perisheth*. This is surely a suggestion that it is soaking into the tissues. It might be usefully added here that Plato and Anaxagoras had taught that all rivers and springs flowed from a vast cavern in the earth, and to it they proceeded. The book of *Ecclesiastes* refers to it somewhat obliquely:

*All the rivers run into the sea; yet the sea is not full; unto the place  
from whence the rivers come, thither shall they return again.*<sup>38</sup>

Sir John Davies' poem *Nosce te Ipsum* (1599) tells very clearly of the circulation of surface water on the earth:

*And as the moisture which the thirsty earth*

*Sucks from the sea, to fill her emptie veins*

.....

*Yet nature so her many streams doth lead and carry*

.....

*Till she her selfe unto the Ocean marry*

*Within whose watry bosome first she lay:*<sup>39</sup>

Davies used correspondences between the geocosm and the microcosm: above he refers to the earth's *veines* and *wombe*. Davies actually uses the word *circulare* in his best known work, *Orchestra* (1596).

*As when a Nymph .....*

*...at last.... falls into the maine,*

*Then all her traverses<sup>c</sup> concluded are*

*And with the Sea, her course is circulare.*<sup>40</sup>

Richard Crashaw (1612-1649) is doubtless referring to Plato's great cavern in *Sospetto d'Herode*,

*Below the Botome of the great Abyссе,*

*There where one Centre reconciles all things,*

*The world's profound Heart pants.*<sup>41</sup>

He is clearly placing the world's deep *Heart* in an analogous situation to the human heart and alludes very clearly to the pumping (panting) action in a circulatory metaphor.

Thomas Traherne (1637 - 1674) was another metaphysical poet who followed science closely and he almost certainly intended a double meaning and an allusion to the rain-cycle in a poem which he actually called *The Circulation*. His correspondences and abridgements find circulations everywhere.

*All Things to Circulation owe*

*Themselvs; by which alone*

*They do exist: .....*

*.....*

*The Thirsty Earth drinks in the Rain,*

---

<sup>c</sup> *Traverses* here is used to mean *crossings* or *movement*.

*The Trees such Moisture at their Roots,*

.....

*Before the other can afford us Fruits ...*

.....

*Which run like Rivers from, into the Main,*

*And all it doth Receiv returns again.<sup>42</sup>*

In addition to the possible confusion caused by this, the analogy of the rain-cycle to the alchemical process of distillation was inevitable. In fact, distillation bears more of a resemblance to the Aristotelian rain cycle than to any circular movement because it basically involves much more of an ascent and descent of liquids and vapours than any type of circular orbiting.

#### **V. 6. WILLIAM HARVEY'S PREDECESSORS<sup>d</sup>**

The first person in Europe to suggest a "minor" and separate circulation of blood through the lungs was Michael Servetus in 1553. Realdo Colombo (1516-1559) also posited a secondary circulation of blood through the lungs in 1559 based on the two facts that the pulmonary artery seemed too large a vessel merely to supply nutriment to the lungs, and secondly that the blood coming from the lungs to the heart was bright red, but the blood going from the heart to the lungs was dark purple. He assumed it was the same blood but had been altered (by the uptake of vital spirit) in the lungs. Colombo's work was known to Harvey, and it is acknowledged to in *de Motu Cordis*.

The 16th century botanist Andrea Cesalpino (1519-1603) did experimentation on the heart and knew of the pulmonary transit, but there is no evidence to show Harvey had

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<sup>d</sup> Witteridge gives an excellent account of Harvey's predecessors in Chapter II of *William Harvey and the Circulation of Blood* (1971). (see ref. 20)

heard of his work before 1628. Cesalpino actually utilized the word *circulatio* in his *Speculum artis medicae Hippocraticum* but in respect to cooling hot blood from the heart.<sup>43</sup> This led Giovanni Nardi in 1655 to aver that Cesalpino had anticipated Harvey's discovery. Harvey's friend, Sir George Ent was very vociferous in righting this wrong and *powerfully warned his hearers when he delivered his anatomical lectures before the Royal College of Physicians in London in 1665.*<sup>44</sup> That it had led to confusion is underlined by Ent some years later: he changed the title of his *Apologia* (which was a book in defense of Harvey's discovery directed particularly against Aemylus Parisanus, a Venetian who had attacked it) from *Apologia pro circulatione sanguinis* as it had appeared in the first edition in 1641 to *Apologia pro circuitione sanguinis* in the second edition of 1685.\*

#### V. 7. PUBLICATION OF *DE MOTU CORDIS*

In 1628, William Harvey published *Exercitatio anatomica de Motu Cordis et sanguinis in animalibus*. The importance of Harvey's work in discovering the circulation of the blood is well documented. It can be said that the philosophical contributions made by overturning years of unproven orthodoxy by irrefutable logic was as important if not more so than the actual discovery. Further contributions were to follow from Descartes, Boyle and Newton.

Harvey depended essentially on reasoning from his own observations and experiments for proof of his contentions. His book established concisely new facts about the circulation of blood around the body. He first deposed once and for all of the idea that arteries contained air: he then went on to show that the heart valves maintain blood flow in one direction only when the ventricles contract - on the right side of the heart

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\* The difference between *circuitio*, *circuitiois*, and *circuitus*, *circuitus* is interesting: *circuitio* means going round and was used militarily (*vigilarum circuitio ac cura* - regular inspection of the guards. Liv.); *circuitus* means more of a revolution. Ent chooses the 2nd declension noun for his title. *Circulatio* was used for circular paths and orbits.

to the lungs, and on the left side to the extremities and the other viscera. He disproved the existence of the micropores in the septum. He reiterated the function of the valves in all the large veins in directing blood flow only towards the right side of the heart. He showed that blood was expelled from the ventricles during systole (contraction) and flowed into them through the heart valves during diastole (relaxation). He proved the arterial pulse was a result of the arteries passively filling with blood pumped from the heart and not by any contraction of their walls. He explained the purpose of the pulmonary circulation from the right ventricle through the lungs and back to the left atrium and ventricle and thus that the blood in the veins was essentially the same liquid as that in the arteries, and the only difference was that the arterial blood was enriched by air.

Whitteridge has rather enthusiastically acclaimed *De Motu Cordis* as the first work of "modern" scientific writing.<sup>45</sup> Harvey's only failure was in not being able to demonstrate the completion of the "circle" between the arteries to the veins. This he could not do because he did not have an adequate microscope at his disposal. Harvey would not postulate "micropores" here (although in effect they actually did exist albeit in the extremities in the form of capillaries rather than in the heart) because he could not demonstrate their existence. All his work was done by his *hypothetico-deductive* method: first comes an uneasiness with the unproven archaic theory; then the search for facts by meticulous and painstaking experiment: more new facts emerge which are further tested by more experiments; eventually a hypothesis emerges which seems to account for all the experimentally proven facts, and even more experiments follow to further test the truth. This revolutionary method based on exacting experimental observations, used by William Harvey in the first part of the 17th century was to set the pattern for general scientific research for generations.

Although Harvey had made a monumental contribution to science with his publication,

a few points about his work are worthy of special mention. Harvey was punctilious in his acknowledgements, particularly to Aristotle, Fabricius and Colombo: and indeed his philosophy remained Aristotelian especially in that he remained a teleologist. His cosmos was Christian and he firmly believed in the Universal Analogy. He was not only the physician of, but also the friend of, Francis Bacon. Bacon, together with Hobbes, as we have mentioned in Capit. II, urged scientists away from the poetic language of *Wits and Scholars* which all learned books had continued to use up till that time (and were to continue to use), and embrace a clearer style like that of *Meckanicks and Artisans*.<sup>46</sup> It is noteworthy that Harvey by and large does not use flowery rhetoric: *In so far as man could break with the past, Harvey put aside older ways of thinking, as older ways of writing.*<sup>47</sup>

Only in one Chapter (Capit.VIII), does William Harvey regress to poetic allusion. He refers to the heart as the deity of the body and invokes many archaic allusions in this Chapter:

*The heart ... is the beginning of life; the sun of the microcosm, even as the sun in his turn might well be designated the heart of the world...It is the household divinity which, discharging its function, nourishes, cherishes, quickens the whole body, and is indeed the foundation of life ..... Now, that the heart is the principle of life, ... I trust no one will deny.*<sup>48</sup>

## V. 8. INITIAL RECEPTION OF *DE MOTU CORDIS*

There was, perhaps predictably, great controversy following the publication of *de Motu Cordis* and this continued to rage for some twenty years. A biographer of William Harvey writes, *after his book of the Circulation of the Blood came out, he fell mightily in practice, and that, 'twas beleaved by the vulgar that he was crack-brained, and all the physitiens were against his opinion.*<sup>49</sup> It would appear from this and other biographies that during this period, an embarrassed silence prevailed. The president



and fellows of the Royal College of Physicians seem to have initially considered his discovery as *an odd eccentricity in a worthy fellow and an excellent friend, one to be listened to and politely humoured, but not discussed.*<sup>50</sup>

Harvey refused to enter into any argument or debate about his discovery until 1649 when he eloquently answered (and demolished) some fairly strong criticisms of the French anatomist, Jean Riolan. The twenty-one years of silence is very interesting. It is highly significant that John Donne did not mention Harvey's discoveries. Poynter cites numerous facts which strongly suggest that Donne had met Harvey and even attended Harvey's Lumleian lectures.<sup>51</sup> Donne made a great number of allusions to medicine (more than any other science) and had a definite obsession with circles ( vide III. 10. ). He considered God to be the perfect circle and thought of the circle as a symbol of God. He even preached a sermon on the subject: *O Eternal and most gracious God, he wrote, who, considered in thy selfe, art a Circle, first and last, and altogether.*<sup>52</sup> Why then did he not seize on the Circulation of the Blood (as we shall see other metaphysical poets who succeeded Donne did so)? This silence is significant evidence of the coolness of the reception of Harvey's ideas in the years immediately following 1628.

#### **V.9. FIRST POETIC REFERENCES TO HARVEY**

The first two poetic references to William Harvey are mentioned for the sake of completeness: indeed the first is in Latin (which is therefore outside the remit of this thesis) and written in 1624. It is by Sir Peter Bowne (1575 - 1624) praising Harvey's dexterity both in his learned lecturing and in his wonderful skill at dissection.<sup>53</sup> The second poem is in English and alludes to Harvey's argumentativeness, as well as his keenness for dissection:

*What ho! Doctor haruie, yt are ranked among perui,<sup>f</sup>  
Are you still dissecting?<sup>64</sup>*

The first poetic reference after 1628 is from William Cartwright (1611 - 1643) and is entitled *A New-Years-Gift to Brian Lord Bishop of Sarum upon the Author's entering Holy Orders, 1638*. Notwithstanding the date in this title, there is some argument as to whether the accession of the Bishop was not until 1641. The verse, however, is,

*Lest in the Man himself there be a Round,  
As in his Humor's found,  
And that return seem to make good  
Circling of Actions, as of Bloud;  
Motion as in a Mill  
Is busie standing still;<sup>65</sup>*

Although this poem does not mention Harvey by name, there is evidence to show that the poet (who was a cleric) had social links with him. These verses represent an interesting piece of evidence for the diffusion of Harvey's ideas outside strictly medical circles.

The first poetical reference to the circulation theory to quote Harvey by name is in 1651 and is by Sir John Berkenhead (1616 - 1679), and interestingly is entitled *In Memory of Mr William Cartwright* (who was the author of the verse quoted above).

Harvey is mentioned thus:

*For as immortall HARVEY'S searching Brain  
Found the Red Spirit's Circle in each Veyn,  
.....  
And proves its Circulation through all Arts.*

---

<sup>f</sup> The term '*perui*' (i.e. *parvis*) alludes to the group of argumentative lawyers who met on the *parvis* or small terrace in front of St. Paul's.

*All-over Wit, ne'r runs a-ground, but rides*

*In ever-flowing never-ebbing Tides.*<sup>56</sup>

Clearly, Berkenhead is in awe of William Harvey as the above poem is very laudatory.

The refutation of Empedoclean circulation is quite definite in his point that wit *rides*,...

*In ever-flowing, never-ebbing Tides,*.

## V. 10. FAMED CIRCULATOR OF THE LESSER WORLD

In 1653, Martin Lluelyn wrote the dedicatory poem to William Harvey's other important anatomical book, *Exercitationes de Generatione Animalium*. Dr Martin Lluelyn (1616 - 81) was certainly a friend of Harvey and a genuine admirer of his work. It has been suggested that it was he who translated both *de Motu Cordis* and *de Generatione Animalium* into English.<sup>57</sup> Although his dedicatory poem appears in *The Generation of Animals*, it is entitled, *To the Incomparable Dr Harvey On his Books Of the Motion of the Heart and Blood And of the Generation of Animals* but the much greater part of it celebrates *de Motu Cordis*. Only the last fourteen of ninety lines are concerned with the work on generation. Harvey is addressed,

*With Drake and Candish<sup>9</sup> hence thy Bays is curld*

*Fam'd Circulator of the Lesser World.*

This could be referred to as a *geocosm/microcosm* analogy and compares Harvey's discovery to the contemporary achievements of the great circumnavigators of the World. Lluelyn pays tribute to Harvey's rejection of long-accepted yet unproven dogma and his reliance purely on scientific deduction from Nature, rather than the traditional reliance on archaic authorities. The challenge to ancient book-learning beginning, notably with Francis Bacon, was to become the hall-mark of the seventeenth century "scientific revolution" characterized by meticulous observation,

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<sup>9</sup> Francis Drake (1580) and Thomas Cavendish (1588) were the second and third circumnavigators of the World.

experimentation and deduction.

*Great Light of Art,*

*Who to the long-dim World dost sight impart ...*

*..... that Science is not Creed*

*From Books to Nature thy appeale is made*

He also describes Harvey's previous battle with adverse critics:

*From Forreign Coasts, and to the conflict come,*

*Some they bold Challengers, thy Seconds some*

*But when Experience<sup>h</sup> vanquish't their defence*

*And Prejudice was captive led by Sense.<sup>58</sup>*

This *Seconds* alludes to James Primerose, who was admitted to the Royal College of Physicians when William Harvey was an examiner the year prior to his virulent but groundless attack on *de Motu Cordis*, in his book, *Exercitationes et Animadversiones in librum Gulielmi Harvaei de Motu Cordis et Circulatione Sanguinis*.<sup>59</sup> The *Forreign Coasts* is a reference mainly to Jean Riolan in Paris, Aemylus Parisianus in Venice and Caspar Hofmann in Altdorf<sup>60</sup> (Germany) all of whom were critical of Harvey's work. The last couplet above refers to Hofmann who later graciously and magnanimously recanted publicly and acknowledged Harvey's great contribution.<sup>61</sup>

In 1654, Thomas Washbourne, the canon of Gloucester, wrote a poem entitled *The Circulation* in which we are left in no doubt that Harvey's theory and evidently his methods had become well known outside purely medical circles. Washbourne's poem starts,

*Our famous Harvey hath made good*

*The circulation of the blood,*

*And what was paradox we know*

---

<sup>h</sup> *Experience* could also mean *Experiment* at this time.

*To be a demonstration now.*

He goes on to mention the correspondence of the rain-cycle (as well as other natural cyclical events):

*Thus we see almost every thing*

*Circling about as in a ring .....*

*Rivers which borrow from the main*

*Their streams, do pay them back again.<sup>82</sup>*

## V. 11. BEYOND A HERCULES LABOURS

In the following year (1656), Dr John Collop included a eulogy to William Harvey in his iconoclastic *Poesis Rediviva* (see also Capit. I, II and III). In this poem, Collop compares Harvey to a latter day Hercules:

*Beyond a Hercules labours thou dost go.*

*Seav'n headed Hydra, error multiply'd,*

*Thou need'st no Club, thy knife can soon divide:*

.....

*Thou set'st up sail, swim's through the purple flood,*

*Which blush'd before, 'cause never understood.*

*Thou circlest through our Microcosm, and we 15*

*Learn more than th' world, our selvs, new worlds by thee.<sup>83</sup>*

These lines echo Lluelyn's comparison of Harvey's discoveries to the circumnavigations of the globe in the dedication of the book. It is noteworthy that earlier in that dedication, Lluelyn used the line, *Prejudice was Captive led by Sense*, and in Collop's poem *On George Ent*, we are told *Till prejudice is Captive led by sense*. It is likely that Collop would have been aware of Lluelyn's lines. Ent was a great friend of William Harvey and is referred to in this poem as *Great Harvy's Second*. Harvey himself is also referred to in this poem:

*While we our William's Conquest do proclaim,  
Not Conqueror of a Land, but whole worlds name  
Intitled to it by each drop of blood  
Which posting round, proclaims his title good;<sup>64</sup>*

Collop made further reference to Harvey in his *Pisse-pot Prophet*.<sup>65</sup> This poem (which is analyzed in Capit. VI) is a satire on the uroscopists and tells of one such quack who is so superstitious and fearful of Harvey that he even fears the statue of William Harvey outside the College of Physicians. In his epigram, *On the Excellent Dr Glisson*, Collop couples Harvey's name with another progressive anatomist, Francis Glisson (1597 - 1677) who worked on nervous tissue and argued against the *pneuma psychicon* or animal spirit referred to earlier in this Chapter.

*The spirit more refin'd may now in vain,  
Knowledge ith' circle, not progresse, complain:  
Harvy, and Glisson, will force all confesse  
Knowledge by circling, now's in the progresse.<sup>66</sup>*

The second line of this implies that Civilization (or *Knowledge*) moves cyclically rather than by linear progress. The final lines confirm the argument: that knowledge progresses cyclically (in the theories of Harvey and Glisson).

Collop also wrote a poem *On the Blood*, which has many similarities to *de Motu Cordis*: the whole poem compares the blood in the microcosm to the sun in the macrocosm. William Harvey himself made a similar comparison between the *heart* and the *Sun* on page 2 of the dedication of *de Motu Cordis*: *The Heart of creatures is the foundation of life, the Prince of all, the Sun of their microcosm*. Collop says,

*Thus blood, Sun-like gives motion, life and sense,  
Spirit and innate heat are nought from hence.*

There is however, in Collop's poem a surprisingly archaic couplet which raises a doubt

as to whether he has grasped Harvey's circulatory concept fully. In lines 7 and 8 of *Of the Blood*, he tells us,

*Now in a full tide channels doth disdain,  
Flows into flesh, and then ebbs back again.*<sup>67</sup>

It is perhaps surprising that this not only Galenic, but Empedoclean reference is given by one so progressive, and indicates the difficulty even progressive thinkers had in understanding and accepting Harvey's revolutionary new theory.

## V. 12. HARVEY, OUR APOLLO

In 1663, thirty-five years after the publication of *de Motu Cordis*, it is clear that Harvey's contribution was by then much more widely recognized and accepted not only amongst his colleagues, but also the laity. During this year Abraham Cowley, M.D. *Regarded in his day as the foremost English poet, he pays graceful tribute ... to the great achievements of William Harvey.*<sup>68</sup> His *Ode Upon Dr Harvey* is almost an apotheosis, in which he alludes to the classical story of Daphne and Apollo, in which Apollo (Harvey) pursues Daphne (*Coy Nature*), but on the point of his conquest of her, she prays to Zeus for help and she is metamorphised into a laurel tree. The classical story ends here with Daphne's virginity intact. In Cowley's Ode, however, this does not halt *Harvey, our Apollo*. He went after her, first into the tree and then into the bloodstream!

*Into the Bark, and root he after her did goe:*

.....

*Harvey pursues, and keeps her still in sight.*

*But as the Deer long hunted takes a flood,*

*She leap't at last into the winding streams of blood.*<sup>69</sup>

She then finds her way to the heart with, let it be noted, an impervious interventricular septum (without micropores), thinking herself to be safe. The way Harvey "rapes"

Nature is very reminiscent of the archaic style and allegory of Edmund Spenser.

*The heart of Man, .....*

*A wall impervious between*

*Divides the very parts within ...*

*.....*

*Harvey was with her there,*

*And held this slippery Proteus in a chain,*

*Till all her mighty Mysteries she descry'd,*

*Which from his wit the attempt before to hide*

*Was the first thing that Nature did in vain.*

Cowley goes on to describe how Harvey has disdained to accept unproven archaic dogma and made his discoveries by experimentation alone using direct observation of Nature as the basis for the new 17th Century scientific method:

*Thus Harvey sought for Truth in Truth's own Book*

and avers that if he had accepted invalidated precepts like many other physicians, instead of forging ahead with his experimental methods, he would never have discovered the Circulation. Cowley himself had published *A Proposition for the Advancement of Experimental Philosophy* in 1661.<sup>70</sup> He goes on to say how Harvey has benefitted medicine, which was itself in dire need of therapy:

*Great Doctor! Th' Art of Curing's cur'd by thee,*

*.....*

*Purg'd of old errors by thy care*

*New dieted, put forth to clearer air,*

*It now will strong and healthful prove,*

*It selfe before Lethargick lay and could not move.*

Sir Geoffrey Keynes in his definitive biography of William Harvey, makes the



extraordinary suggestion that *Harvey was on terms of friendship with a much greater man, the poet Abraham Cowley.*<sup>71</sup> He also proposed that Cowley's book on Experimental Philosophy owed much to Harvey's influence: the title page has an insistence on experiment, and Cowley proposed the building of a college for Harveian style research with a surgeon and many animals for experimentation.

Also in 1663, the poet John Dryden (1631 - 1700) (who was Poet Laureate in 1668) mentions William Harvey and the Circulation. In his epistle to his *Honoured Friend, Dr Charlton*, Dryden wrote,

*The Circling streams, once thought but pools, of blood*

*(Whether Life's fewel, or the Bodie's food)*

*From dark Oblivion, Harvey's name shall save*

*While Ent keeps all the honour that he gave.*<sup>72</sup>

We have seen above how Sir George Ent was Harvey's great friend and defender, and here Dryden implies that Ent's confidence in Harvey and his vociferous and evidently well-known defence of his older friend reflect well on Ent himself. Dryden's lines also give further evidence that Harvey's revolutionary Circulation theory has reached the non-medical public.

Sawday has suggested that after the acceptance of *du Motu Cordis*, the language of some English poets changes.

*Harvey's discoveries, symbolic of the advances of science itself would seem to have been assimilated into the common vocabulary of scientist and poet alike.*<sup>73</sup>

Could it be that the scientists' attempts to embrace a clearer style of English to describe their anatomical discoveries without recourse to allegory, has weakened the former importance of the correspondences which had hitherto been so important not only to poetry, but to the Elizabethan concept of the World?

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## **CHAPTER VI**

### **ON UROSCOPY**

*Hence looking glasses, Chamberpots we call  
'Cause in your pisse, we can discover all.<sup>1</sup>*

John COLLOP (1658)

#### **VI. 1. ORIGINS OF UROSCOPY.**

Hippocrates had mentioned briefly that urine examination could be helpful,<sup>2</sup> but it certainly took on much more importance in the Middle Ages when astrology and uroscopy became the mainstays of diagnosis. It was based on the supposition that evidence could be obtained from the fluid which had filtered through every part of the body, gathering important clues as it did so: urine was a constant and copious substance readily available for examination the results of which could be linked with humoralism and astrology, forging an obvious link with the macrocosm/microcosm analogy.

Examination of faeces and also blood were performed but these were not considered as important as uroscopy.<sup>3</sup> Inspection of the pulse was also used in diagnosis based on the fanciful concept that the rhythm of the heart corresponded to the harmony of the heavenly spheres.<sup>4</sup> In the 13th century, the English physician, Ricardus Anglicus (fl. 1230) wrote two works on this subject, *A Tractate of Urines* and *On the Rules of Urines*.<sup>5</sup> In a fifteenth century book of Caxton, we are told that uroscopy was the first skill attributed to *Maximan* who is a Master of Physic and can tell why *peple* are sick by examination of the urine.

*Maximan, the maistre of phisike*

*Seeth the urin of the peple;*

---

<sup>1</sup> The music of the heavens was referred to in II.11. In Tillyard's *World Picture*, it was the third and final part of the trilogy; the *Chain* (v.l.1); the *Correspondences* (v.l.5) and the *Cosmic Dance*.<sup>6</sup>

*He can saye to them*

*Whereof they be seke.<sup>7b</sup>*

This form of illness divination dates from before the 9th Century, when European medicine was centred on the monasteries and in the hands of the monks. During this era, spiritual health and medicine were inextricable. The rise of the professional medical establishment only slowly took over from the clerics, it is certainly difficult to give a precise date for this but the rise of the Salerno medical school in the 9th Century is certainly significant (the school is mentioned as already being "ancient" in AD 846).<sup>8</sup> Ecclesiastical interdicts forbade monks any longer to act as physicians: it was suggested that *the financial rewards were considered detrimental to their piety.*<sup>9</sup>

## VI. 2. CHAUCERIAN UROSCOPY

When the clergy were no longer allowed to visit their former patients, they diagnosed illness and directed treatment by examination of the urine alone. Contemporary illustrations of mediaeval physicians almost always show them carrying urinals, as a sort of badge of office rather in the same way that a stethoscope draped around the neck signifies "physician" nowadays. The Ellesmere manuscript, a beautiful hand-illuminated copy of *The Canterbury Tales* written in the early 15th century, contains a fine picture of the *Doctour of Phisik* holding a urinal up to the light to inspect its contents. Hoeniger states

*so widespread was the method of diagnosing from elaborate urinoscopy that it became emblematic of the medical profession itself. Some doctors advertised their profession by the sign of a urinal.<sup>10</sup>*

Geoffrey Chaucer refers to uroscopy indirectly: after his arrogant posturing physician has told a sad story to the Canterbury Pilgrims, the host addresses him thus:

---

<sup>b</sup> *seke* is *sick*

*I pray to God so save .....*

*..... thyne urinals and thy jordanes,<sup>c</sup>*

*Thyn ypocras,<sup>d</sup> and eke thy galianes,<sup>e</sup>*

*And everye boyste<sup>f</sup> ful of thy letuarie;<sup>g</sup>*

After bestowing this blessing on the physician, the host jestingly tells him that his story touched his heart so much that he will need some heart medicine. He then quickly changes his mind however and decides to take

*Or elles a draught of corny ale.<sup>h</sup>*

The reader is left to make his own mind up as to the sincerity of the host's gracious blessing on the physician, followed by the statement that the doctor's story was so heart-rending he will need some heart medicine, but then an immediate tergiversation for a glass of malty ale. It is likely that Chaucer is indirectly mocking the physician with sarcasm. He certainly is not taking him very seriously.

### VI. 3. DENUNCIATION OF WATER-CASTING IN THE 17TH CENTURY

In Robert Burton's ironical view of seventeenth century life, *An Anatomy of Melancholy*, (1621) he would affirm this, in a far from complimentary manner; he derides:

*to be a physician, a piss-pot caster, 'tis loathed.<sup>i</sup>*

As early as the 10th century, some scepticism was expressed about over reliance on uroscopy. In the *Guide for Physicians by Isaac Judaeus* we hear criticism of

*fools who would base prophesies on it, without seeing the patient,*

---

<sup>c</sup> *chamberpots*

<sup>d</sup> *ypocras* was a wine sweetened with honey and with added spices. It was doubtless chosen for its pun on Hippocrates.

<sup>e</sup> *galianes* is thought to be remedies named after Galen (i.e. galenicals)

<sup>f</sup> *boyst* is a box

<sup>g</sup> *letuarie* is an *electuary* which is an extemporaneous preparation, composed of dry powders, formed into a proper consistence by the addition of syrup, or honey (thought to be from the Greek, *ekleikasma*)



*and determine what disease is present, and whether the patient will die,  
and other foolishness.*<sup>13</sup>

In 1601 the College of Physicians found it necessary to pass a statute<sup>14</sup> denouncing watercasting as charlatanism and its members were proscribed from giving advice merely by uroscopy without seeing the patient himself. Sadly this did not stop it not even among college members.

Marlowe presents a summary of Elizabethan medicine in *Tamburlaine*, (1587) which brings together other features of contemporary practice very eloquently. The physician starts his prognosis by firstly emphasizing the supreme importance of uroscopy, he then gives us allusions to humoral theory and the importance of Galenic spirits. He also mentions critical days ( vide III.4).

*I view'd your urine, and the hypostasis,<sup>h</sup>*

*Thick and obscure, doth make your danger great:*

*Your veins are full of accidental heat,*

*Whereby the moisture of your blood is dried:*

*The humidum and calor, which some hold*

90

*Is not a parcel of the elements,*

*But of a substance more divine and pure,*

*Is almost clean extinguished and spent;*

*Which, being the cause of life, imports your death:*

*Besides, my lord, this day is critical,<sup>j</sup>*

95

*Dangerous to those whose crisis is as yours:*

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<sup>h</sup> *Hypostasis* is the sediment.

<sup>i</sup> *accidental* here means an *unfortunate* occurrence and refers to the heat and moisture *humidum* and *calor* in line 90 coming together.

<sup>j</sup> The four types of critical days have been examined in Capit. III.

*Your artiers, which amongst<sup>k</sup> the veins convey  
The lively spirit<sup>l</sup> which the heart engenders,  
Are parch'd and void of spirits, that the soul,  
Wanting those organons<sup>m</sup> by which it moves,  
Cannot endure, by arguments of art.*

100

It immediately appears that extreme importance is placed on inspection of the urine: it is the first factor he mentions, when asked for his prognosis. The king is told that the sediment in his water *doth make* (his) *danger great*. The physician goes on to point out in the same sentence that the balance of the hot and cold blood is distempered: there is too much heat. He then refers to the idea (vide IV) that the arteries do not exist for the transport of blood but for that *substance more divine and pure* and the king is short of this which imports his death. This pessimism is reinforced by the fact that evidently the day is *critical*. We are not told whether the good doctor's diagnosis of the critical day is clinical or astrological: we heard earlier in the scene that *Tamburlaine cannot stand* and is *shaking and quivering*, and therefore may have reached a clinical crisis. It is very possible, however, that the doctor had not made a physical examination of his patient, but based his prognosis on the examination of his urine and horoscope alone. He also displays the aloof distance and academic interest which seems to be a feature of the contemporary physician: he concludes,

*Yet, if your majesty may escape this day  
No doubt but you shall soon recover all.*<sup>15</sup>

In fact *Tamburlaine* dies.

John Webster, (1580 - 1625) however, appears to have been aware of the views of the

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<sup>k</sup> *amongst* means *alongside*.

<sup>l</sup> *lively spirits* here is *vital spirit*, (see Capit. IV)

<sup>m</sup> *organons* means *instruments*, and thus the organons by which the soul moves are the vital spirits

College on watercasting. In the *Duchess of Malfi*, (1613) *Bosola* scorns uroscopy thus:

*Doth he study physiognomy?*

*There's no more credit to be given to th' face*

*Than to a sick man's urine, which some call*

*The physician's whore, because she cozens<sup>n</sup> him.<sup>16</sup>*

In fact, Webster is quite right here: without underestimating the value ascribed in modern medicine to proper examination of the urine, there are more pathological conditions which can be diagnosed by careful inspection of the face, than of the urine.

#### VI. 4. SHAKESPEAREAN WATER-CASTERS

Shakespeare mentions the practice more than once. In *Twelfth Night*, when *Fabian* and *Sir Toby* are considering whether or not *Malvolio* is mad, it is suggested that *Maria*,

*Carry his water to the wise woman.<sup>17</sup>*

This implies that psychological disease can be diagnosed uroscopically. In *Macbeth*, the king uses this type of diagnostic test metaphorically, saying to his Scottish doctor:

*Throw physic to the dogs - I'll none of it.*

*... If thou could'st, doctor, cast*

*The water of my land, find her disease,*

*And purge it to a sound and pristine health,*

*I would applaud thee .....*

.....

*What rhubarb, cyme<sup>o</sup> or what purgative drug*

*Would scour these English hence?<sup>18</sup>*

As an aside, we hear of two contemporary purgatives, rhubarb was a relatively new

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<sup>n</sup> *cozens* deceives

<sup>o</sup> *Cyme* is the old name for *senna*

drug at the time *Macbeth* (1606) was published, having only arrived in the country in 1573. Senna, however was an old established purgative and Shakespeare's audience would be well aware of the action of purgatives : what better metaphor to let them know about the Scot's dislike of the English?

In *Two Gentlemen of Verona*, *Speed* relates to *Valentine* an absurd description of a lover:

*... these follies are within you, and shine through you like the water in an urinal, that not an eye that sees you but is a physician to comment on your malady.*<sup>19</sup>

Shakespeare, however, lets us know that prognostication on seeing the water alone in the absence of the patient is poor practice: *Falstaff* has evidently sent his young page to the physician with a sample of his urine.

FALSTAFF: *Sirrah, you giant, what says the doctor to my water?*

PAGE: *He said, sir, the water itself was a good healthy water; but as for the party that owned it, he might have more diseases than he knew for!*<sup>20</sup>

The doctor here is quite clearly saying that although there is nothing wrong with the urine, there is quite a lot of pathology in its purveyor. In other words that it was necessary to see the patient and not only the urine.

In this case, Shakespeare appears respectful to *Falstaff's* physician whose integrity is sound and who is following the edicts of his College. His portrayal of doctors as such is said to be the result of his good relationship with his son-on-law, John Hall, a Stratford physician. Indeed there is a letter to Mr Hall, which is from a patient (one Sid Davenport), too sick to attend, but starts:

*Good Mr Hall,*

*I sent my boy to you this morning to carrie my water and acquaint you*

*with what daunger and extremitie I am faullen into in respect my shortness of  
breath & obstructions of my liver....*

It had the desired effect as we are told that as a result of it, Hall made a home visit to Mr Davenport the following day, as a result of which Hall was fined by Stratford-upon-Avon Council for not attending a Council meeting!<sup>21</sup> Clearly Hall was a competent and caring practitioner.

The esteem shown by Shakespeare to physicians is not absolute. Of the eight he portrays, only one - *Dr Caius*, a choleric Frenchman, in the *Merry Wives of Windsor* - is a buffoon referred to as *Castalian - King Urinal* and *Mounseur Mockwater*. The *Parson* later threatens him, *I will knog<sup>p</sup> your urinal about your knave's costard<sup>q</sup>*.<sup>22</sup> It is noteworthy that on the few occasions when the Bard chooses to poke fun at a physician, not only does he make him French, but refers directly to watercasting. This surely implies that Shakespeare's audience would be sceptical themselves about uroscopy otherwise not one, but three jokes would fall flat. Shakespeare infers here that ordinary people who are generally pragmatic must have had little faith in uroscopy, presumably because the diagnoses based on it must have been wrong too often.

## VI. 5. THE PISSE-POT PROPHET

Dr John Collop's portrayal of a quack physician, *A Pisse-Pot Prophet* (1656) is also far from complimentary. Collop first describes a posturing, strutting, extremely well-dressed quack, who tries to baffle his poor patient with medical jargon, relating to the three Galenic spirits, and dyscrasia<sup>r</sup> through imbalance of hot and cold humours,

*Your liver's foul, and stomach, pains ith' heart,*

7

---

<sup>p</sup> *knock*

<sup>q</sup> *costard* was a slang word for *head*, but literally meant *apple*.

<sup>r</sup> *dyscrasia* an obsolete term (from Greek *dus* - bad, *krasis* mixture) meaning a condition of morbid composition of body fluids, especially of the blood.

*We cardialgia<sup>a</sup> call it men of art.*

*Your spirits natural; vital, animal be,*

*And I'me afraid, not from obstructions free:* 10

*Would of erratique griefs you causes know?*

*Your livers hot, cold stomach, thence to the brain*

*Vapors arise in Clouds, showre back again*

*You are hydroptick<sup>t</sup>, nay Cachectick<sup>u</sup> too,*

*I strangely fear a discrasy<sup>v</sup> in you.* 15

The poor patient, somewhat bewildered at how his doctor has come to this conclusion asks how this has been diagnosed and is given an amazing reply:

*Lord Master Doctor where have you this read?*

*I'th urine man; By this I ev'n can know*

*Each step and stair by which to bed you go.* 25

*Pisse takes the forme of parts as it runs through*

*I could no better know, was I in you.*

*Hence looking glasses, Chamberpots we call*

*'Cause in your pisse we can discover all.<sup>23</sup>*

Although Collop is certainly derisive of the practice, he tells us here why it had been held to be so important in the past. In the couplet on lines 26 and 27, he dictates the philosophy behind the practice: the urine collecting from all parts of the body will necessarily contain traces of any and every disease and disorder. In an age before radiology and endoscopy could visualize the inside of the body, an examination of the urine was the next best thing.

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<sup>a</sup> *cardialgia*, heartburn (from Greek *kardia* heart and *algos* pain)

<sup>t</sup> relating to dropsy or accumulation of fluid in the tissues

<sup>u</sup> a severely undernourished state characterized by extreme wasting

<sup>v</sup> see dyscrasia

Collop certainly knows of the College's proscription of uroscopy, for his quack doctor actually mentions it sarcastically later in the poem:

*The Seminalities of all ills in pisse*

31

*To trust in this the College doth forbid*

*Vile men would prelate-like have knowledge hid.*

Collop attacks water-casters sarcastically in another poem,

*The Country quack with terms of art;*

*Who by pisse prophesying wonders doth impart.<sup>24</sup>*

Contemporary poetry certainly shows that the ancient practice of uroscopy was flourishing in the seventeenth century. Shakespeare's and Webster's references illustrate that they are both aware it is bad practice, and Dr Collop's iconoclastic attack on the procedure is characteristically vituperous. It evidently lived on, however, in the superstitious mind for many more years, and even as late as 1836 a poem from Derbyshire implies that uroscopy was still practised in country areas.<sup>25</sup>

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## **CHAPTER VII**

### **ON PHLEBOTOMY**

*Lest to his bloody art, th' Leech too much trust,*

*To take him off, we need from graves fetch dust.<sup>1</sup>*

John COLLOP (1656) .

#### **VII. 1. ORIGINS OF BLOODLETTING**

Phlebotomy or the practice of bloodletting as a therapy is undoubtedly very ancient and was known to the ancient Egyptians and Mesopotamians before the Greeks. The Hippocratics based it on the premise that the cause for disease is a dysharmony (or *dyscrasia*) of the humours of the body; consequently treatment was based on restoring that balance . The two major physical methods of adjusting the imbalance were by phlebotomy and purgation, but emetics and enemata (*clysters*) were also used. Since blood is a humour itself and also a vehicle for the other humours, venesection would reduce a general excess of humours (or *plethora*) as well as diminish the actual quantity of blood in the body.

Hippocrates advocated both purgation and phlebotomy only with great circumspection<sup>2</sup> and there was definitely controversy about the relative merits between the two Hellenistic physicians, Erasistratus (c.325-c.250 BC) and Herophilus (c.335-c.250 BC). Erasistratus advocated against excessive bleeding (so much so that Galen later said he never used it at all<sup>3</sup>). Herophilus on the other hand thought it more efficacious than dietary means for treating plethoras.<sup>4</sup> The Roman school were more definitely in favour of bleeding and Galen's reasoned arguments in favour of phlebotomy put the "Galenic seal of approval" on venesection for centuries to come.

## VII. 2. LEECHBOOKS

Mayer describes *A Mediaeval English Leechbook* and a poem which contains forty-five couplets is believed to be the oldest English poem on the subject. It starts by saying,

*Ye Maistres that use blode lating,*

*And thereby gete your leving,*

*Here ye may lever<sup>a</sup> wisdom gode*

*In what place ye shall lete bloode*

*In man woman and childe<sup>5</sup>*

The second line certainly implies that phlebotomy was an occupation or livelihood in the 14th Century, (possibly carried out by barbers), and the fifth line tells us it was even performed on children. Thirty-two sites on the body where veins may be opened for specific diseases are identified. Twenty-six maladies are described ranging from *sawseflem* (acne) for which the *forhede* must be *blede*, to *gouty* for which the *Salvatic vein* (archaic terminology for a vein on the outside of the ankle) must be *clensith well*. The whole poem has a delightful charm from its robustness and freshness; its date is unknown though it was written between 1320 and 1420. The city of Salerno in Southern Italy was a great centre of medical teaching in the eleventh and twelfth centuries. It had produced the famous textbook, *Regimen Sanitatis Salernitatum* which laid out not only basic guidelines and rules for therapy, but also similar guidelines for prevention of disease. (vide II.3) It was this positive health philosophy which led to the *annual springtime bleeding undertaken in the Middle Ages<sup>6</sup>* as some ritual part of a personal hygiene programme (comparable to colonic irrigation in 20th century U.S.A.). In 15th century England, the *Egerton Manuscript* also points out in verse that only certain veins are suitable for phlebotomy:

*Ye that wyll lette gude men blode*

---

<sup>a</sup> *lever* is *learn*

*And vaynes wyth all youwre lives fode.*

*Some vaynes use ye*

*And many others let ye be<sup>7</sup>*

Sir John Harington (1561-1612) translated the Salerno Regimen from Latin in the early 17th century and his vernacular version tells the treatments available for fever:

*As diet, drinke, hot baths, whence sweat is growing*

*With purging, vomiting, and letting blood:*

*Which taken in due time, not overflowing*

*Each malladies infection is withstood.*

*The last of these is best, if skill and reason,*

*Respect age, strength, quantity and season.*

*Of seventy from seventeene, if blood abound*

*The opening of a veine is healthfull found<sup>8</sup>*

The third line is confusing: here *not overflowing* applies to *sweat* in the first line rather than any blood. It means that the venesection must be performed before the crisis of the fever. It also describes that the amount bled depends on age, strength, weight and astrological considerations. It can be seen from this that phlebotomy was not only governed by rational physical factors, but also by traditional beliefs in the celestial influences.

### VII. 3. PRACTICAL CONSIDERATIONS

Three types of bloodletting were practised: first *venesection* or simply cutting open the vein with a sharp instrument, secondly *cupping*, which did not always involve the actual loss of blood from the body, and thirdly the application of bloodsucking leeches. Another method was to *draw blood from the nose with the bristles of a boar*,<sup>9</sup> but this was unusual. Cupping or *ventosynge*, which was even more harrowing for the patient than phlebotomy, could be either dry or moist: *dry cupping* involved placing a heated

cup over the skin; as the air cooled, the flesh underneath would be sucked up into the cup and blood would be sucked out of the vein into the subcutaneous tissues to form a large bruise; in *moist cupping* the skin would be lanced or *garsyed* or even abraded by *smytynge of the nayles*<sup>10</sup> and the blood would be sucked through the small wounds in the skin and into the cup. Leeches tended to be used locally to clean swollen, pustular or swollen skin.<sup>b</sup> It would be *an alternative to, rather than a substitute for, phlebotomy*<sup>11</sup>. They were thought to be especially useful to cleanse the blood *bytwene the depenesse of the body and the skyn*<sup>12</sup> and would be used for festering wounds, ulcers, carbuncles and haemorrhoids. The leeches were supposed to be taken from running streams rather than stagnant water and were starved for a day before use.

In *Love's Labours Lost*, *Berowne* says,

*A fever in your blood! Why then incision*

*Would let her out in saucers; sweet mis-prison!*<sup>13</sup>

The *saucer* or blood-porringer was the vessel used by the phlebotomist; it held a little more than three fluid ounces and therefore enabled the barber-surgeon a means of estimating the amount of blood he had let, as the quantity bled depended on which humour was thought to be in distemperate excess. The physicians themselves would leave bloodletting, enemas etc. to surgeons. Ambroise Paré (1510-1590), the famous French surgeon tells us,

*Doctors consider it to be beneath their dignity to sully their hands*<sup>14</sup>

The skin about to be incised was prepared by rubbing, warming or massaging in order to bring the vein into prominence. This is alluded to in *Troilus and Cressida*: *Nestor* says (aside), *O, this is well! He rubs the vein of him* only twelve lines before *Ajax* declares,

*I'll let his humours blood*<sup>15</sup>

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<sup>b</sup> This method of the treatment is still occasionally used today by plastic surgeons.

Shakespeare also alludes to the importance timing for the treatment. When *King Richard II* orders *Bolingbroke* and *Mowbray* not to fight, he enjoins,

*Let's purge this choler without letting blood,*

.....

*Our doctors say this is no month to bleed.*<sup>16</sup>

This brings in the concept, already referred to above (III 7,8) that only certain months were propitious for bleeding. This Shakespearean reference to astrological considerations is echoed by Beaumont and Fletcher in *The Chances*:

*Why, all Physicians*

*And penny Almanacks allow the opening*

*Of veins this moneth:*<sup>c</sup> 17

#### VII. 4. LEECHES, ANIMAL AND HUMAN

Leeches were so intimately associated with the art of medicine that in Anglo-Saxon, the word *laece* applies to both *doctor* and *blood-sucking parasitic worm*. There is no evidence that physicians were named after the blood-suckers because of their extortionate fees for treatment. Notwithstanding the double meaning of the word, Chaucer uses the term *leche(s)* eleven times always as a physician and never as a parasite. He also uses *lechecraft* to mean the skill of a physician, or the art of medicine. In the *Faery Queen*, Edmund Spenser only uses the term *leach* and never refers to a physician as such in his major work, although he uses the term once in *Amoretti*. He also writes a sceptical Sonnet about a *leach* in which he addresses him as *vayne man*. Shakespeare directly mentions a leech in *Timon of Athens* to mean physician,

*Make war breed peace, make peace stint war, make each*

*Prescribe to other, as each others leech.*<sup>18</sup>

Here another medical metaphor is invoked to imply that by bringing about peace for

---

<sup>c</sup> month

There is little doubt that bloodletting was widely practised in the sixteenth and seventeenth century, but one gets the strong impression of scepticism in many of the poetical references. Ben Jonson also refers to a *horse-leech* (although never to a leach or leech). He uses it facetiously, however, saying,

Here he is referring to the fact that when the leeches have sucked enough blood from their host, they drop off. Webster is certainly ridiculing the practice in *Duchess of Malfi* when *Bosola* tells,

**Andrew Marvell certainly gives us the most colourful metaphor comparing the King's bankrupt bankers and sycophants at court to the use of leeches on haemorrhoids:**

The use of leeches as a treatment for haemorrhoids is further mentioned by the metaphysical poet, John Cleveland (1613 - 1658) in his anti-Scottish poem *The Rebell Scot*:

<sup>d</sup> *postern* gate or opening, also a slight pun on posterior

In fact, the use of leeches on thrombosed external piles would be quite efficacious: they would reduce the swelling painlessly and quickly in a very painful and distressing condition.

## VII. 5. RANKNESS

Kail states "*rankness*" was a medical state usually requiring bloodletting.<sup>23</sup> and indeed, when *Mark Antony* sees *Caesar's* bleeding corpse, he says,

*I know not, gentlemen, what you intend,*

*Who else must be let blood, who else is rank?*<sup>24</sup>

and *Oliver* in *As You Like It*, when wondering how to get even with his brother, muses,

*I will physick your rankness.*<sup>25</sup>

The renegade *Archbishop of York* uses the same medical metaphor when he tells *Westmoreland* that bleeding (in the double sense of actually bleeding in war and also venesection) will serve to cleanse the corruption (of land and body).

*:we are all diseas'd*

.....

*And we must bleed for it; .....*

.....

*..... diet rank minds sick of happiness*

*And purge th' obstructions which begin to stop*

*Our very veins of life.*<sup>26</sup>

The *Archbishop* suggests that purgatives and dieting are alternative treatments to bloodletting: he implies that it is also possible to *diet rank minds* or even to *purge th' obstructions*. This verse also underlines an important distinction between opposing theories of health and disease. The Hippocratic tradition was that good health is the natural state and that sensible eating (fitted to one's complexion), enough rest and sleep, and avoidance of overindulgence and stress will keep us in this natural healthy condition. The opposite view that the body tends towards disease and may need

invasive phlebotomy, for example, as a means of maintaining the harmonious balance, and to keep illness at bay was also held. Bernard Gordon (b.1258) had compared the two contrasting views four hundred years previously and criticized colleagues who preferred *the lucrative treatment of diseases*<sup>27</sup> to the *preventative application of a good regimen*<sup>27</sup> (of health).

Shakespeare also alludes to the more invasive approach when *Coriolanus* is bleeding

*The blood I drop is rather physical*

*Than dangerous to me*<sup>28</sup>

In this sense *physical* means *appertaining to physic* and is an example of the concept that surgical intervention is necessary for health. (see also VII.7). Shakespeare only refers to bleeding a few times more<sup>29</sup> and these are literary metaphors rather than true medical allusions.

## VII. 6. ALTERNATIVE TREATMENTS

Fletcher refers to the obvious controversies about whether to bleed, purge, give an emetic or even an enema (*clyster*). *Francisco's* two friends suggest three various remedies showing that the laity were well aware of available treatments. The problem is that first, *his colour faded strangely*, then *He sweats extremely*, and eventually he becomes *Hot, very hot, his pulse beats like a drum*:

VALENTINE:           *Come lead him in, he shall to bed: a vomit, I'll have a vomit for him.*

ALICE:               *A purge first,  
And if he breathed a vein  
No, no, no bleeding.*

VALENTINE:           *A clyster will cool all*

Two scenes later, in a scorning portrayal of the indecisiveness of contemporary physicians, the cameo is repeated by three medical attendants. The scene starts: *Enter 3 physicians with an urinal*.

THIRD PHYSICIAN:   *Tis a most pestilent contagious fever*

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<sup>27</sup> by which the practitioner would make more money.



*A surfeit, a plaguy surfeit; he must bleed.*

**FIRST PHYSICIAN:** *By no means.*

**THIRD PHYSICIAN:** *I say bleed.*

**FIRST PHYSICIAN:** *I say tis dangerous:*

*The person being spent so much beforehand*

*And Nature drawn so low, clysters, cool clysters.*

**SECOND PHYSICIAN:** *Now with your favours I should think a vomit.<sup>30</sup>*

Here, the poet has illustrated three important points of contemporary medicine. Implicit in both scenes is the primacy of Galenic humoralism: neither the friends nor the doctors would need to treat the *surfeit* if they did not believe disease to be the result of humoral imbalance; all their suggested alternatives, although muddled, are aimed to redress that imbalance. Secondly, Fletcher shows us that there is certainly more than one method of procuring the restitution of humoral harmony: he alludes to emetics, phlebotomy, purgatives and enemata (*clysters*). Finally and very wittily, he shows how indecisive physicians were then<sup>1</sup>, being quite unable to arrive at a unanimous decision.

## VII. 7. THE BLOODY ART DENOUNCED

Dr John Collop who *admired and upheld all that was best in medicine in his day*<sup>31</sup> condemns phlebotomy in a short poem called *Against Phlebotomy to a Leech*:

*Tell stories of Corruption of the blood:*

*What's once corrupt, can it return to good?*

*To th' habit from privation, how's recesse?*

5

.....

*Would each blood-sucking Leech the knowledge had.*

*The treasury of life they'd not exhaust.*

.....

*Lest to his bloody art th' Leech too much trust*

15

*To take him off we need from graves fetch dust.<sup>32</sup>*

By *Corruption*, Collop is probably referring to a legal parallel: *Termes de la Ley* (1641) states *When any is attainted with Felony or Treason, then his blood is said to bee*

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<sup>1</sup> They still are!

*corrupt, by means whereof his children, nor any of his Bloud, cannot be heirs to him.*<sup>33</sup>

In other words, once blood is *corrupt*, there can be no possible restitution. He then develops the argument in the next two lines by recourse to Aristotelian logic. *Habit* in line 5 is the eighth of Aristotle's categories and implies a positiveness of *having* a quality: *privation* is the converse thereof. The last couplet is very powerful implying that the only way to stop the leech from venesection is to show him a corpse.

The consecutive poem in Collop's book is called *For Phlebotomy*. This does not of course indicate a change of heart, but is the poet-physician's sarcastic presentation of the arguments for blood-letting. He argues, tongue in cheek, that men should certainly lose blood by phlebotomy since women lose it monthly, and goes on to point out that blood is also lost from nose bleeds and piles. In effect, Collop states the old Hippocratic view, albeit sarcastically, saying that Nature creates her own balance, tending towards natural good health, without surgical intervention.

*The Courses Nature doth in Women take*

*To open veins, shall we in men forsake?*

*Where Nature dictates, who will not submit?*

*She keeps her Monthly terms to plead for it.*

*See'll argue a priori by the Nose;*

*And by the Breech a posteriori shows:*

*When Natures self doth once turn Critical,*

*I pray resign, no Criticks be at all;*

*'Gainst all Phlebotomy who plead, sure jest:*

*In th' mood they plead for to refute it best.*<sup>34</sup>

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## **CONCLUSION**

One Latin text which was translated directly into vernacular Middle English verse was the *Regimen sanitatis Salernitanum*. The earliest known Middle English translation of this is the *Compendium of Astrological Medicine*,<sup>1</sup> probably written between 1387 and 1400 whose verses bring together instruction in the influences of the four elements, four humours, and the signs of the zodiac upon man, and in the perilous days for blood-letting and the locations of veins to be opened for specific ailments. It is not likely that this was intended merely for ease of learning for medical students (which has been suggested)<sup>2</sup>, but rather for the rapidly growing literate laity. The *Compendium* starts:

*God made all mankynd that lyves on the earth*

*Of iiij<sup>a</sup> elementys, als we in bokys rede:*

*Of fyre and of ayre, of watir and of erthe,*

*That gendirs in us humors, als Arystotille us lers.<sup>b</sup>*

Two hundred years later in 1607, Harington also translated the Salernian Regimen into English verse and in it he not only described the humours but also the results of humoral imbalance (vide II.2). It is suggested that these vernacular poems were not principally meant for the ease of medical students (who could speak Latin, and therefore understand the original *Regimen* anyway) but rather as a jingle which the patients could themselves be taught to recite so that they could, as it were, take some knowledge home with them.

In the introduction (1.8.(a)), it was pointed out that the choice of topics for chapters in

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<sup>a</sup> *iiij*, four

<sup>b</sup> *that engender in us the humours of which Aristotle taught.*

this work had been mainly dictated by what the contemporary poets had written about. The question arises, however, as to *why* the poets selected these areas of medicine at all, and what their verses are saying about medical knowledge of the time. In other words, why the poets chose the subjects they did to comment on. The concept of the microcosm/macrocosm correspondence (Cap. I) is a poetic metaphor in itself and indeed it would be more difficult to explain a reason if this had not been seized upon as a subject for poetry.

Donne and Milton illustrate the idea of the *Chain of Being* (I.1). Poetical references from Herbert, Vaughan, Shakespeare, Donne and Hammond tell us of the Universal analogy and quotations from *King Lear* and *Pericles* emphasize the current hylozoistic philosophy (I.4). The doctrine of correspondences as horizontal connections between the vertical planes of the living universe are represented by both Donne and Fletcher. John Donne's threnody, (*The First Anniversary* is a metaphor of the World's own mortality: it starts, *Well dy'ed the World*, and is subtitled *An Anatomie of the Worlde*. Phineas Fletcher's correspondences of the World and human anatomy in the *Purple Island* are bewildering and far-fetched. Sawday has described them as *One of the last great examples of poetic correspondence*. Sawday has called the increasing interest by poets in anatomy and the interior of the human body an *autoptic view*, and has argued that it is directly related to Vesalius' revolutionary work, *De humani corporis fabrica*, (1543) which was the first comprehensive book on human anatomy, and based not on Galenic dogma, but on Vesalius' own observations on dissections of human cadavers meticulously performed by himself.

It is interesting that both Donne and Fletcher are vehemently anti-Catholic and both these poems in their own way are anti Popish. Donnes' millenarianism expressed in the First Anniveray was solidly Protestant and the Puritans were expecting the World to come to an end. The title of Fletcher's *Purple Island* could itself be an indication of

his High Puritanism. The Island is a metaphor for Britain separate from Catholic Europe, and Purple is the Anglican colour for mourning.

Poetical allusions to humoralism throughout the period of study are not rare. In the 14th century, they can be found in the *Compendium of Astrological Medicine* (quoted above) and abound in Chaucer's verses (II.6). During the succeeding 300 years most of the major English poets, including Shakespeare, Marvell, Donne, and Herbert all give references to the humours. The poets' motives for choosing these elemental substances as subjects for their verses differs, however, throughout the time scale, and Chaucer and Henryson almost certainly had a different reason to Ben Jonson and John Collop. The heavy reliance of alchemy on humoral theory was outlined in II.4, and Linden (1993) in his extensive study on alchemy in the literature of this period argues that it was this era (1385 - 1700) that *marked the height of interest in alchemy*. He posits that all the early allusions to the subject were satirical and follows the irony of Chaucer's *Canon Yeoman's Tale* through the popular works of Dunbar and Skelton to the satirical views of the Elizabethan poets. He considers Jonson's attacks on alchemy mark the end of this tradition. Subsequent references by Donne, Herbert, Milton and Vaughan diverge away from satire and use alchemy as *a richly suggestive basis for metaphor* and as *a subtle and learned vehicle for expressing change, growth, regeneration and salvation*.<sup>3</sup>

In addition to his attack on alchemical charlatanism, Chaucer also pokes fun at his arrogant *Doctour of Physick* but it is not likely that he is satirizing the classical humoral theory on which his *practisour* based his practice. Chaucer himself probably believed that *everiche maladye* was caused by *hooft or cold or moiste or drye*. It was accepted dogma and the rudiments would be generally well known, particularly in the literate laity who read Chaucers' poetry - otherwise there would be little point in making so many references to it. When Henryson's monk curses poor *Cresseid* by

saying, *I change .... thy moisture and thy heit in cald and dry*, it is likely that the reader would know that moisture and heat is blood, and that cold and dry is black bile (melancholy). The same assumption can be made with respect to Shakespeare: Tillyard avers that, *When Cleopatra said she was all wind and fire, the educated part of the audience at least would understand with the slightest effort of memory.*

But although the Bard's audiences knew, they did not share the same implicit faith in humoralism with Chaucer's readers. By the last half of the 17th century the validity of Galenic humours had been called into question. Paracelsus had refuted it entirely. It was certainly not that Paracelsianism had been accepted and supplanted humoralism: indeed most English poetical references to Paracelsus and his doctrines are uncomplimentary (II.8), but where there once had been certainty about the humours, there was now a lot of doubt and scepticism. During the brief episode of the Comedy of Humours, it was fashionable to poke fun at what was formerly a cornerstone of Galenic medicine. Whereas the ridicule of Chaucer was directed solely at the Doctor in the 14th century and not at his beliefs, by the 16th century, the poets were almost certainly now poking fun at both the physician and the principles of medicine which guided him.

To correct the imbalance of humours which led to disease, certain practical methods were available. As early as the 14th and 15th centuries *blode lating*<sup>c</sup> leechbooks written in verse were available (vide VII.2). These were certainly intended for non-professionals and underline the fact that contemporary poetry gives an insight into popular medical (and surgical) knowledge. Two hundred years later, the laity were still aware of the benefits of phlebotomy and verses from Shakespeare, Jonson, Cleveland, Marvell, Webster and Beaumont & Fletcher give practical details of the techniques in the 17th century (VII.3,4,5,). Fletcher emphasises the controversies surrounding the

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<sup>c</sup> *blood letting*



alternative methods of correcting humoral imbalance (emetics, cathartics and enemata) (VII.6). It was pointed out in the Prolegomenon that the nature of poetry often involves archaic language; a specific problem in the Chapter on humours was a semantic one relating to the use of the word *humour* which altered during the early 17th century. It was at this time during the so-called *Comedy of Humours* that the word altered its meaning from its basic physiological one to that of one's disposition or temperament (II.10).

Indeed, in an introduction to Ben Jonson's *Every Man in his Own Humour* we are informed, *by the end of the sixteenth century 'humour' had lapsed into a catchword to connote sheer extravagance or eccentricity.*<sup>4</sup> Ben Jonson went to great pains in 1616 to define the true idea of *Humour* as he meant it, or

*To give these ignorant well-spoken dayes,*

*Some taste of their abuse of this word Humour.*

He defined the word for those poor souls who had been forced

*Daily to see how the poore innocent word*

*Is rackt, and tortur'd.*<sup>4</sup>

Not much emphasis can therefore be placed on any allusions in the particular Comedy of Humours genre. It may, however, give an indication of the trends of popular thought at the very beginning of the seventeenth century.

It most certainly signifies a great change in outlook from Chaucer, Henryson and the pre-Renaissance English poets who had little or no doubts about the validity of classical Galenic humoral theory. Their verses indicate an implicit belief in the validity of humoralism. The Comedy of Humours and the references in the last section of the chapter which range from scepticism to mockery show that for some poets at least, the primacy of classical Galenic theory had been relegated to farce. Humoralism, however, was by no means dead: Dr. Lazar Riverius' book on *Practical Medicine*,

essentially Galenic, was such a popular book in so much demand by contemporary physicians that the first edition in 1655 was reprinted many times - even as late as 1735 and 1738.<sup>5</sup> The great popularity of Riverius' book might well give a strong impression that doctors who bought and used it would agree with its author that the theory of humours is *certis, firmis et indubitatis*.<sup>6</sup> This might be misleading, however, *Practical Medicine* was just that - a useful, "hands-on", practical text that was in some uses theory - independent for the practitioner using it, and this could account for its continued popularity long after its indubitable theoretical basis had been superseded. Furthermore, in *The Road to Medical Enlightenment 1650 - 1695*, King says ... *new ideas had not found wide acceptance in 1655, for a strongly conservative bent permeated the seventeenth century*.<sup>7</sup> In line with this, most poetical allusions to humours do show that even the progressive and revolutionary metaphysical poets appear to still accept the archaic principles of humoral theory. It may then be said that study of seventeenth century poetry does give some insight into contemporary medical thought with respect to developments in humoral theory. The absolute faith of Chaucer and Henryson has given way to doubt and uncertainty, although the overwhelming majority of allusions cling firmly onto Galen's traditional tenets. Great changes were taking place in the seventeenth century and it was certainly an era of intellectual progress. Francis Bacon had urged his scientific colleagues to even alter their flowery literary (often Latin) language and change to down-to-earth English prose. Poetry, too had undoubtedly changed and John Donne exemplified the new metaphysical genre. Notwithstanding this fresh new modern style of verse, examination of contemporary poetry leaves us in little doubt that although the poets were aware of the *New Philosophy*, they had not yet accepted it. Like so many others, until they had proof, they still clung on to the old order.

Thus it has been shown that contemporary poetry reflects trends in medicine and in particular demonstrates that the great changes in medicine which took place between

the sixteenth and seventeenth centuries are reflected by the poets of the day. In the verses of Geoffrey Chaucer and Robert Henryson, we are left in absolutely no doubt as to the importance of astrology in the minds of contemporary poets. Chaucer was a keen astrologer himself, writing *the first competent* treatise on the Astrolabe,<sup>8</sup> and as such his knowledge of the subject is encyclopaedic. Chaucer introduces his *Doctour of Phisik* by telling us right from the start that he had no peer because of his astrological knowledge, and goes on to himself quote references from earlier centuries. (vide III.3). Chaucer's wonderful astrological allusions in *Miller's Tale*, *Man of Law's Tale* and the *Book of the Duchess* underline the supremacy of iatromathematica in the 14th century. He also alludes to image-making (III.5). Throughout the fifteenth and sixteenth Centuries, it has been shown that astronomy formed an important part of the curriculum in the training of doctors, and the poetry of Halle, Massinger and Marlowe all confirm that a well-trained physician need have a good working knowledge of astrology. With respect to astrology and medicine, there is no doubt about the great interdependence of the two subjects up to the discoveries of Copernicus, Kepler and Galileo around the turn of the seventeenth century. Indeed up to that time, one of the chief defences of astrology lay in its comparison with medicine, but in and after that period, this was no longer the case. In the *History of Western Astrology*, Tester actually refers to this period as the *Second Death of Astrology*.<sup>9</sup> This is surely an overstatement, but the progress in astronomical theory had certainly been a great setback to the primacy of astrology. Shakespeare certainly knew of the former importance of astrology in medicine: he cites references to the influence of astrology to the timing of phlebotomy, and to the dominion of different parts of the body. He gives more than one allusion to the importance of the planets in the causation of disease.(III.7) Although Shakespeare gives no direct references to the new astronomical discoveries, which were eventually to discredit astrology, he certainly wrote quite a few verses which show his definite scepticism of it. Perhaps the most

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<sup>8</sup> He considered the *First Death* to be the virulent attack on astrology by St. Augustine in the 3rd century.

quoted literary couplet beloved by the antagonists of astrology comes from the lips of Cassius:

*The fault, dear Brutus, is not in our stars*

*But in ourselves, that we are underlings.<sup>9</sup>*

The lives of John Milton (1608-1674) and John Donne (1573-1631) overlap with that of William Shakespeare (1564-1616), and all these three great English poets were writing at the time of the astronomical revolution. Unlike the Bard of Avon, Milton and Donne both made explicit references to the discoveries of Copernicus and Kepler: Milton talks of a heliocentric universe and they both allude to eccentric planetary orbits (III.9,10). What is perhaps somewhat surprising is that neither of them give us any reference to astrology. It is particularly noteworthy that Donne does not refer to the interdependence of astrology and medicine. We are told that the two main interests in his life are medicine and cosmology.<sup>10</sup> Indeed, his biographers argue as to which one of these two subjects was closer to his heart. But even in years when medical students still had to study astronomy, neither he nor Milton give us references to it. Their resounding silence is surely significant. It is perhaps an even more eloquent criticism on the current state of iatromathematica than the active ridicule of Collopi. Tester maintained it had died, *like an animal or plant left stranded by evolution*,<sup>11</sup> but it had not really died (not even twice!) it is still alive for that matter, but it had lost its imperative certainty. The whole world had become uncertain. Nobody really knew any more. The planets were still pursuing their annual courses through the signs of the Zodiac, but a philosophical change had taken place in the mind of Renaissance man and a new philosophy had called *all in doubt*.

It can be said therefore that the study of English poetry in the sixteenth and seventeenth century gives an insight into the popular perception of the place of astrology in the practice of medicine. The great importance emphasized by Chaucer

had gone. Astrology had depended on astronomy, but now astronomical theory had been revolutionized. Some critics considered that as a result of this, astrology had died. There were still some respected physicians who adhered to the old beliefs and books continued to be published including Saunders *Astrological Physick* (1677), Nicholas Culpeper's *Astrological Judgement of Diseases* (1651), William Andrews *The Astrological Physician* (1656) and others.<sup>12</sup> In 1652 most of the British astrologers (including the famous herbalist and astrological physician, Nicholas Culpeper) forecast a total solar eclipse in a tract *Catastrophe Magnatum*. Some hinted it may be the end of the World. On Black Monday, March 29, 1652, *thousands of Londoners locked themselves in their houses, others ran mad in the streets and hanged themselves, whilst one dauntless quack did a thriving trade in Medicines, Pills, and Antidotes against the effect of the eclipse*. The eclipse was minimal and the day remained fine and clear. Although this fiasco did not crush the astrologers, it was used to great effect by their opponents. To reiterate Dick, a vast corpus of ancient lore had dwindled to an empty shell of superstition.<sup>13</sup> The silence of the progressive metaphysical poets could indicate that on-one needed to argue about it, no-one would speak ill of the dead and little more would be heard of it.

Although Fracastorius, as an Italian who wrote Latin verse cannot be invoked to support my thesis which is concerned with English poetry, it would be negligent not to mention his inception of the name *Syphilis* as the hero of an epic poem. Fracastorius is seen to be a firm Galenist in most respects: he considered astrological influences to be important in the causation of disease and he was also a dedicated follower of humoral theory. His one very significant divergence from Galen was in the importance of the ontology of disease rather than the Galenic specificity of the individual (see IV.7). His new concept that a syphilis germ, for example, was independent of the initial humoral balance of the person it infected, and that when the seed itself had been eradicated from the individual, the disease would be cured was a revolutionary new concept.

Many references to the Great Pox and its treatment are given by Dunbar, Shakespeare and Sir John Davies (IV.8) which all prove that a great wealth of knowledge about the disease was disseminated amongst the laity. In addition to the Great Pox, some poetical allusions to the Small Pox are quoted from a number of 17th century poets, including Dryden (IV.11). All in all, although the references to contagion as a cause of disease give an insight into current medical ideas, they do not support any idea that those beliefs in England had reflected progress in medical knowledge. Fracastorius had written *de Contagionis* in 1546 and even if he was not the *de novo* originator of germ theory, he had certainly re-introduced it in forceful and clear terms in an important new revised form to what should have been a receptive Renaissance medical world. That audience was evidently very slow to accept it, and this is clearly reflected in the English poetry of the time.

Uroscopy was the basic currency of the physician from early mediaeval times and from before Chaucer's time to the nineteenth century, the stereotype of the physician was that of a man holding a urinal. Geoffrey Chaucer's allusions to it are indirect, but some of the earliest English poets tell of its great importance. Uroscopy fell into disrepute in the 16th century and was denounced by the College of Physicians. The verses of Marlowe underline the former importance of the practice in prognosis, but Webster and Shakespeare both denounced it as quackery. Another poet (who was also a physician) who was vociferous in his condemnation of uroscopy is Dr John Collop. He was introduced in the first chapter and has been quoted throughout in this dissertation: he is a minor poet who was unscathingly critical of the old unproven Galenic medical dogma and attacked the old order vociferously. His book of poems, *Poesis Rediviva* has been cited in most chapters of this thesis, and although I am mindful that he is neither typical nor well-known, he was medically qualified. Collop, however, is not writing his verses for other doctors, but for the laity, and as such his poetry is particularly pertinent to my argument. Since only a small minority of the poems in his

book are medical, it can be assumed he is aiming his work at a general audience, and that the few poems about physic are an attempt to educate that audience about contemporary medicine. He attacked the concept of man as a microcosm of the greater universe in his poem, *Man, a Microcosm*, which deals a powerful satirical blow to the Universal Analogy and all the ideas consequent upon it. He ridiculed humoral theory in a poem dedicated to doing just that.<sup>14</sup> In another he derided Galen himself describing his theories as '*scurf*'!<sup>15</sup> He ridiculed phlebotomy eloquently and effectively in two poems,<sup>16</sup> one *For Phlebotomy* and one *Against Phlebotomy* in the latter of which he proposed the arguments against the practice most sarcastically. It would seem, however, that the iconoclastic Collop was most impressed by William Harvey's discoveries and he mentioned him in a number of his works in most eulogistic terms. (V.10)

The concept of moral retribution which had been so important to Henryson (II.6) and Spenser (IV.2,3) remains far from extinct in the period under study. It has been suggested that even in mediaeval literature, this "Nemesis" idea is mainly used as a "literary device",<sup>17</sup> and indeed it is the very nature of poetry and poetic license, but supernatural agents were definitely suggested as the main causes of the Black Death. (III.2, IV.4) It is interesting to note I was able to find hardly any poetical references to the Great Plague itself, and Wenzel and Woolf have also remarked that surprisingly few references were made to the Pestilence in the English literature (as compared to the continental).<sup>18</sup>

Another archaic concept which survived in poetry and therefore presumably in the Elizabethan mind was that of *miasma*. Shakespeare gives a number of references to the idea that poisoned air caused epidemics and Marlowe, Webster, Jonson and Donne also give references to the idea (IV.6) almost a hundred years after Fracastorius' work.

Aristotle had considered the heart to be the seat of the soul, the centre of life. It is perhaps this Aristotelian concept which is the basis of references to the heart as the seat of emotion, a perception which continues to persist even in modern poetry. The heart was the base for the sensory soul, one of the three tripartite souls of Plato. Shakespeare alluded to this tripartite soul and Spenser underlines the heart's primacy (V.1). John Davies' poetry, however, engendered reference to the Elizabethan controversy about the site of the soul (V.1). Marlowe alluded to the two types of blood vessel which had been long known, and the Galenic *vital spirit* in the arteries (V.2). Most poets in the first half of the 16th century were (understandably) Galenic in their allusions to circulation. Both Donne and Fletcher refer to the Galenic micropores in the interventricular septum, the latter by incredible allegory. Fletcher also compared the blood vessels to rivers - as did Henry Vaughan - and gives a graphic poetical description of the heart valves (V.3). In addition to these anatomical references, Shakespeare gives quite a few allusions to the Empedoclean theories of the shuttlewise ebb and flow theory of the blood, particularly in *King Henry V* in which his allegory of blood flow is a definite correspondence with the tides (V.4). The term *circulation* before the publication of Harvey's *de Motu Cordis* was used to correspond blood flow to the rain cycle and references from Sylvester, Vaughan, John Davies, Crashaw, Traherne, Denham and Fulke Greville all allude to this (V.5).

It is generally held that William Harvey played a leading part in the so-called Period of Medical Revolution<sup>19</sup> in the 17th century and Harvey is usually cited as one of the most important of the revolutionaries.<sup>20</sup> However, there is little doubt, certainly if the poetry is taken as an indicator, that this Revolution was very slow. After the publication in 1628 of the important milestone, *de Motu Cordis*, reception was very cool and controversy raged in both England and in Europe. Harvey was attacked vituperously from many quarters. He maintained a dignified silence, however, for some twenty-one years. After this long latent period, his outstanding contribution, which was essentially



*'to add a scientific basis to the clinical practice and ethical position of the Hippocratic physician,'<sup>21</sup> was recognised and towards the end of his career he received some acclaim. Harvey remained a dedicated Aristotelian throughout his life. Indeed this deference to his mentor has been a main cause of criticism of him. Some critics have said that Harvey is merely*

*a representative of a strongly Aristotelian tradition and his quantitation is of only secondary importance. To them Harvey's idea of the circulation of the blood did not come from the experimentation but from his belief in the Aristotelian principles that circular motion was the most perfect type of action and that the heart was the centre of life.<sup>22</sup>*

This is surely an oversight of Harvey's contribution to scientific experimentation and philosophy. There is little doubt of his respect for Aristotle, however and the only time in *de Motu Cordis* where Harvey stopped using plain language to slip into poetry is when he referred to the heart as the *sun of the microcosm*<sup>23</sup> (a neoplatonic reference to Aristotelianism and also the Universal Analogy (I.4). In the same way Donne remained silent about iatromathematica, he once again failed to mention Harvey's discoveries despite his intense fascination with Circles and also his interest in medicine. His silence is once more significant and may be cited as evidence of the initial chill response to Harvey's ideas in the years immediately after 1628.

The first references to the work occur in the lay poetry of Cartwright in 1638 and Berkenhead in 1651 (V.9). A few years later three medically qualified poets, Collop (1653), Lluellen (1653) and Cowley (1663) wrote highly complimentary eulogies to him. Their poems say that he goes *Beyond a Hercules' Labours*<sup>24</sup> and that he *Cures... Th'Art of Curing*<sup>25</sup> (V.10,11,12). This clearly shows that at least one section of the medical fraternity believed even by then they owed a great debt of gratitude to him. Thomas Washbourne (1654) and John Dryden (1663) show that Harvey's fame had spread beyond purely medical circles, however, and that his theory was known to the

lay public (V.13). Some of the laudatory verses to Harvey were penned whilst he was still alive.

These allusions to the new haemodynamic theory is in contrast to the acceptance of Fracastorius ideas (see Capit. IV). Both theories were incomplete, and both required the future invention of the microscope and further technology to prove them: capillaries could not be seen to prove Harvey's theory nor could bacteria to vindicate Fracastorius. It would seem, however, that seventeenth century England was far more ready to accept Harvey's unfinished work rather than the unproven premise of Fracastorius. Is the reason for this because of the unshakeably held Mediaeval World Picture of the Universal Analogy in the *collective unconscious* of the Elizabethan? In this model, the circulation of the blood could still be interpreted as a correspondence, and was not so revolutionary at all, being perceived as only slightly different from the rain-cycle or the circular movement of the stars.

Nicolson makes the very interesting suggestion that there *was* popular interest in Harvey's theories, but for what seems now a surprising reason. Harvey's new concept that the dark blood in the veins and the bright red blood in the arteries were in fact the same fluid in a different stage of a circular motion provided the key to *the greater mystery of the circulation of the waters of the earth in streams, rivers and seas*.<sup>26</sup> If venous and arterial blood were one and the same fluid at different points in a circular motion, then here was a correspondence between fresh and salt water in the rain-cycle. Henry More wrote,

*The Sea is a Fountain of Moisture and administers to the Springs underneath as the Springs supply the Rivers above-ground, and so imitate the Circulation of Blod in Man's Body.*<sup>27</sup>

The aim of this dissertation was to show that *Study of English Poetry up to the end of*

*the 17th century gives an insight into contemporary popular medical ideas.* The earliest poetical reference was the *Compendium of Astrological medicine* written for the laity in the late 14th century. That one poem brought together allusions of the humours and iatromathematica and phlebotomy. As later references have been examined, further poetical allusions have shown that poetry is a good index of the layman's knowledge of medicine. The Galenic ideas which had been present since their introduction into this country after 1100 were slow to be superseded and this was reflected by the poets. Although some scepticism was creeping in, new ideas were not quickly accepted even five hundred years later with the Age of Enlightenment and the Scientific Revolution. One thing which the poetry does show with the passage of time is the lack of certainty in the Galenic dogma. The 17th century was certainly a time of change and uncertainty. The New Philosophy had clearly called all in doubt. That indubitability of Chaucer had become scepticism with Shakespeare, even greater uncertainty with Donne and disbelief with Collop. Collop, however, although he wrote for the lay public, was a doctor himself and so does not give a true index of the depth of popular beliefs. The uncertainty of Donne is surely a better indication of what the layman was thinking. He perhaps sums up his apprehension most eloquently in the *Second Anniversary*.

*Have not all soules thought  
For many ages, that our body is wrought  
Of Ayre and Fire, and other Elements?  
And now they thinke of new ingredients  
And one Soule thinkes one, and another way  
Another thinkes, and 'tis an even lay.<sup>28</sup>*

*an even lay* almost implies one man's guess is as good as another. It certainly implies scepticism.

It appears that lay perception of medical theories and treatments have undergone a

number of radical changes during the period studied. In the 14th century, there was an apparent absolute belief and trust in the dogma, if not the practitioners. Doubt obviously develops concomitantly with the introduction of revolutionary new ideas in the 15th and 16th centuries, and this doubt changes to real scepticism by the late 17th century. All this parallels the changes that were happening over that period in other branches of knowledge and learning. In the case of medicine they presage a more active opposition to professional physicians who come to suffer actual ridicule in the poetry of later years.

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## **POSTLEGOMENON**

Thomas Sydenham (1624 - 1689) was the first great 17th century physician to benefit from the Baconian method and the revolutionary works of William Harvey. When he was asked what books of medicine he recommended for study, he suggested *Don Quixote* by Cervantes. Sir St. Clair Thomson in his Annual Oration to the London Medical Society in 1916 said,

*if any of us today, had to name the one author which every medical man should study deeply with diligence and delight, surely it would be the greatest of our great Englishmen, who died 300 years ago, William Shakespeare.*

He argued that although the science of medicine is inexorably progressive, human nature does not change, and pointed out that Shakespeare's plays will continue to be read by physicians when uncontemporary medical texts become eclipsed, and concluded his oration:

*The works of this master of medicine will continue to be studied by future generations until, ' there shall be no more death, neither sorrowing, nor crying, neither shall there be any more pain.'*

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<sup>f</sup> It is an interesting, though inconsequential, fact that both William Shakespeare and Miguel Cervantes both died on the same day, 23rd April 1616.